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# AUTOMOTIVE INDUSTRIES

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JULY 23, 1938

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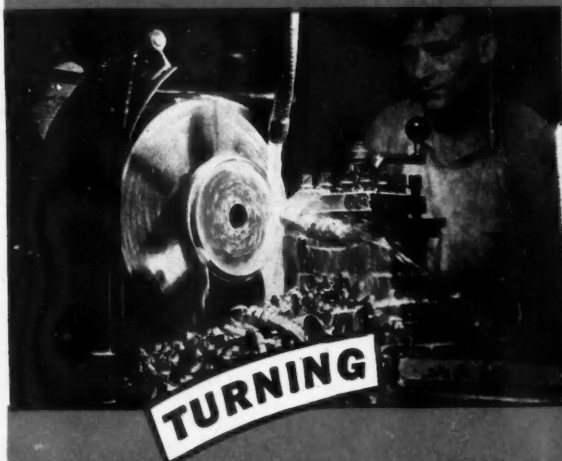
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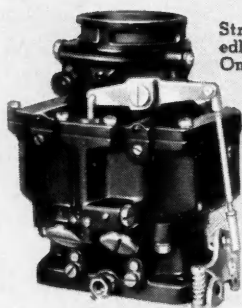


**220-YARD LOW HURDLES**  
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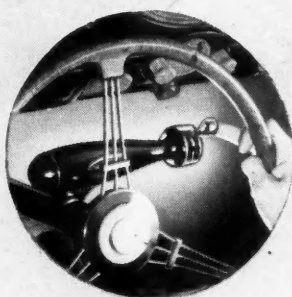


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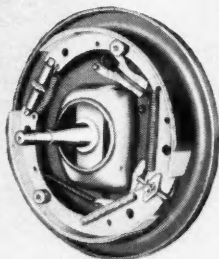
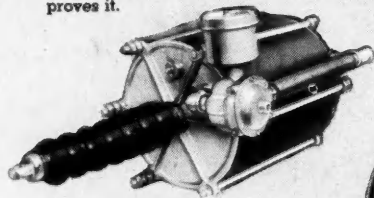


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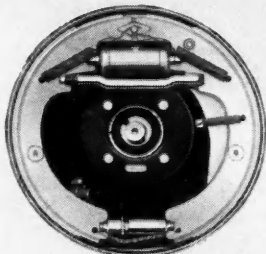


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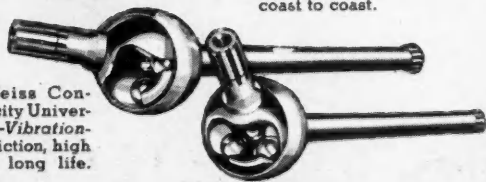
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**E**VERY salesman knows how much even small shortcomings in the car he's selling can affect his sales performance. When prospects harp on these faults, it keeps a salesman from bearing down and doing a real job of selling the far more important advantages his car may have.

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Now, while the slide rules wave and the blue prints flutter and good-natured gents grow short-tempered, give Bendix a chance to pitch in and help a bit—

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# AUTOMOTIVE INDUSTRIES

**AUTOMOBILE**

Reg. U. S. Pat. Off.  
Published Weekly

Volume 79 Number 4

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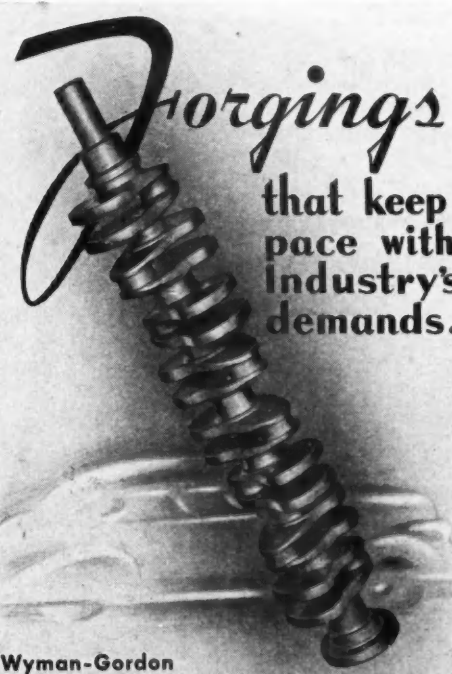
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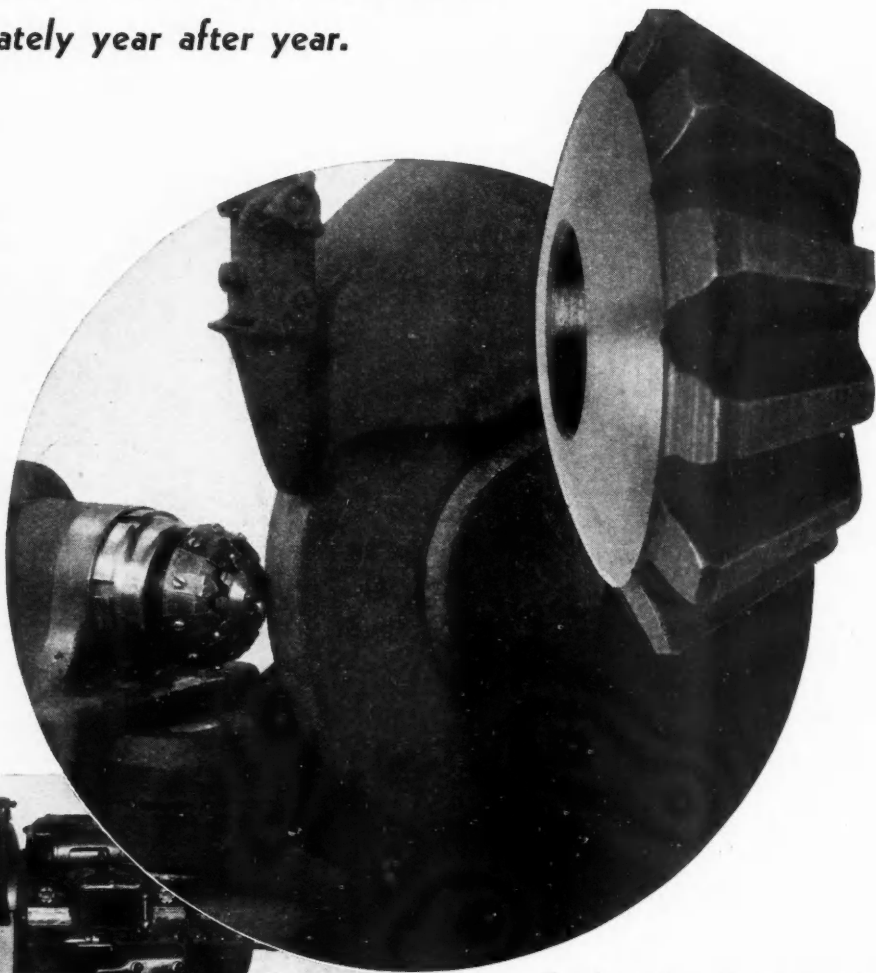
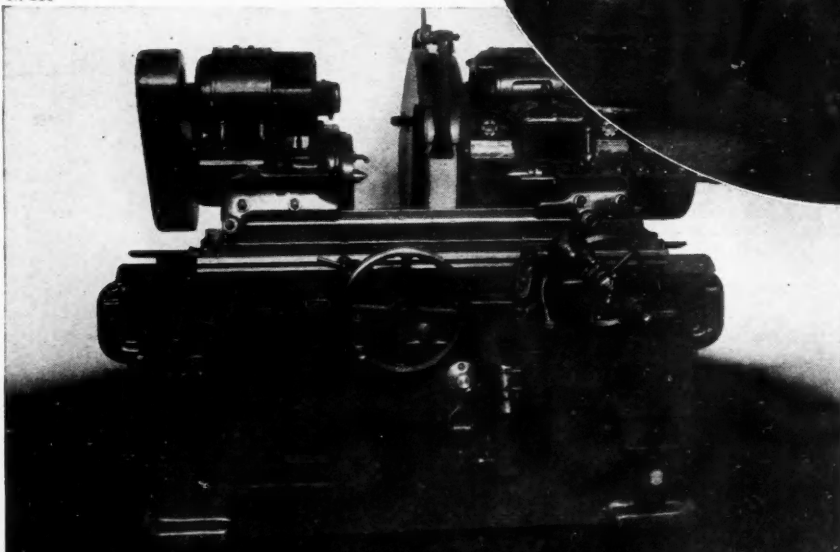
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A Norton 10" x 18" Type C Cylindrical Grinder of today

# NORTON GRINDERS

July 23, 1938

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*Automotive Industries*

AUTOMOTIVE INDUSTRIES, Vol. 79, No. 4. Published weekly by Chilton Co., Chestnut & 56th Sts., Phila. Entered as Second-Class Matter October 1, 1925, at the Post Office at Philadelphia, Pa.; Under the Act of Congress of March 3, 1879. In Case of Non-Delivery Return Postage Guaranteed. Subscription price: United States, Mexico, United States Possessions, and all countries in the Postal Union, \$1.00 per year. Canadian and Foreign, \$2.00 per year; single copies, 25 cents, except Statistical Issue (Feb. 26, 1938), 50 cents.

# AUTOMOTIVE INDUSTRIES

## Production

### *Usual Seasonal Modifications Send Output Down to 30,600*

The usual seasonal modifications in production of cars and trucks was evident during the past week with final assembly lines in a number of plants closed down in preparation for the annual changeover period.

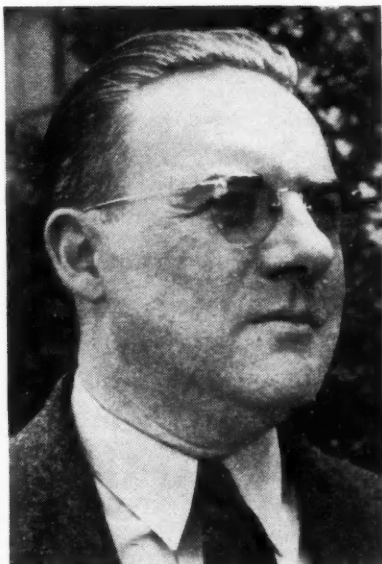
Manufacturers expected, however, to add around 30,600 new cars and trucks to the month's total during the past week, according to a preliminary check of production schedules. Although most plants will continue to operate in a number of departments, further trimming of output in so far as final assemblies are concerned may be expected with the usual fall upturn expected to be evident by the first part of September.

This week's production when considered in connection with the revised output of 42,000 cars and trucks for the previous week and 25,000 for the first week in July will bring the total for the first three weeks in the month just under 100,000 units.

The week's total was achieved largely at Chevrolet and Buick in the General Motors group, Plymouth and Dodge in the Chrysler group, Ford, Hudson, Studebaker and Nash. The GM plants contributed an estimated 12,400 cars and trucks to the total, Ford 11,000 and Chrysler plants 3000, Nash 650, Hudson 450 and Studebaker 120.—J. A. L.

### **Detroit to Honor Ford**

Detroit citizens will honor Henry Ford's 75th birthday anniversary at a huge birthday party to be held at the Masonic Temple on July 30. Alex Dow, president of the Detroit Edison Co., will serve as toastmaster and speakers will include William S. Knudsen, president of General Motors Corp.; W. J. Cameron, Ford Motor Co., and Edgar A. Guest, Detroit poet.



**RAYMOND SZYMANOWITZ**

... former technical director of Acheson Colloids Corp., Inc., who has been advanced to vice-president and technical director of Acheson Industries, Inc., technical development company for the Acheson interests.

## Ford Dealer Plan

### *Schedules Regional Meetings With Factory Executives*

Ford's key dealers in many metropolitan centers are being invited to regional meetings with factory executives at which dealer grievances are to be discussed, and factory policies will be presented in detail. This much is apparent from scattered reports which have come in from various parts of the country, although Ford officials reached for comment said that such meetings are not different from those held each year in the various sales zones. Considerable significance is attached to the move by the National Automobile Dealers Association, which has this to say about it in the July N.A.D.A. *Bulletin*:

That the Ford Motor Co. is keenly alive to its responsibilities to the thousands of merchants who distribute Ford products throughout  
(Turn to page 103, please)

## AUTOMOTIVE INDUSTRIES

### *Summary of Automotive Production Activity (Week Ending July 23)*

**BUSES** Activity generally regarded as "spotty" with many producers averaging slightly above 50 per cent capacity, and no general improvement expected before Labor Day. One large company received two sizeable orders: One for 125 forty-passenger single-deck coaches, and another for 100 buses scheduled to operate at New York World's Fair.

**TRUCKS** No sign of general upturn in orders, although one manufacturer reports rate up about 25 per cent over last week. A government contract for 318 two and one-half ton units was awarded to one of the leading producers.

**AUTOMOBILES** Output dwindled under influence of usual seasonal modifications with 30,600 cars and trucks estimated for week. Trimming of output will bring total for first three weeks of July just under 100,000.

**MARINE ENGINES** Sales currently off about 40 per cent from year ago, with installations running about 60 per cent lower. Industry has entered its seasonal decline, but anticipates a rise by December if current improvement in general business continues.

**AIRCRAFT ENGINES** Eastern seaboard manufacturers running at capacity. Most engines now in production slated for army and navy.

*This summary is based on confidential information of current actual production rates from leading producers in each field covered. Staff members in Detroit, Chicago, New York and Philadelphia collect the basic information, in all cases from official factory sources.*

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## Study Lauds "Big Three" Leadership

*Struggle Between Automobile Companies Viewed as "High Mark of Useful Competition" by Brookings Institution Report*

Struggle between the three largest organizations in the automobile field has set the high mark of useful competition thus far, according to the report of a study made public recently by the Brookings Institution, Washington, D. C. The study, "Industrial Price Policies and Economic Progress," was made by Dr. Edwin G. Nourse, director of the Institute of Economics, and Dr. Horace B. Drury, a member of the staff. It analyzes today's technology and pattern of business organization as well as the new philosophy of prices, and continues the general line of investigation of income distribution in relation to economic progress which was begun at the Institution about five years ago. Case histories of numerous corporations, large and small, were investigated as part of the inquiry. It was financed by means of a grant by the Maurice and Laura Falk Foundation of Pittsburgh.

Although methods of industrial price-making have undergone a vast change since the days when nearly all prices were fixed by direct market bargaining, this change has not brought a net decline in competition, states the report. Modern competition may be more beneficial to the people than that of earlier times, inasmuch as it develops new and better products, raw materials, and ways of satisfying human wants, rather than being concerned solely with price.

Efforts to maintain artificially high prices under modern competitive conditions have little chance of success over a period of years, and

the price-fixing power of so-called monopolies has clearly diminished, the report says. Even if a concern has an effective monopoly of a particular product, it is likely under modern technical conditions to meet keen competition from other products that satisfy consumer wants in different ways.

Large corporations occupy an important place in modern industry, not alone because of the technological need for large units of equipment, but also for economic reasons. A company must have large financial resources and furnish a fraction of the product large enough to be a significant factor in the market if it is to set the pace in price-making. Far-seeing and courageous price-making has made the enlightened business executive the most important factor in the functioning of the modern economic system, the report states.

Over a large section of industry, production is keyed to prices set in advance at a point computed to be the most effective in expanding the sale of goods. The extent to which economic progress is promoted depends largely upon the promptness and completeness with which prices reflect the progressive improvements in technological processes. Radical changes of both product and processes, making lower prices possible, have become characteristic of the operation of the most progressive industries.

Price competition is most apparent among companies selling direct to the final consumer. But if the people are to get full benefit of our

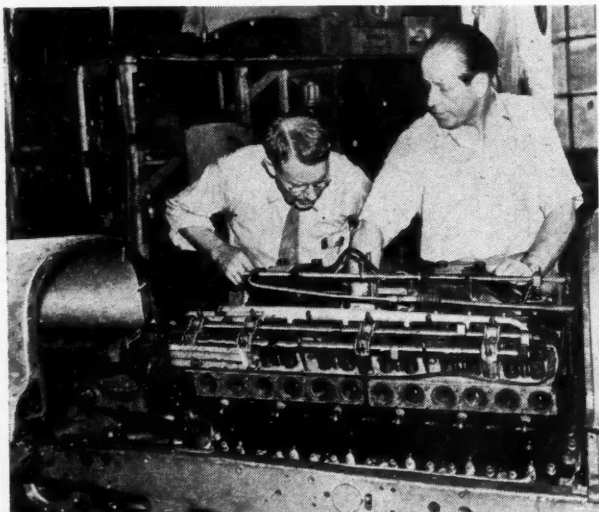
industrial system similar price-making practices must be adopted throughout the various industries whose output goes into these products in their earlier stages—the so-called "heavy industries."

The study found that companies which have been able to assume large overhead expenses to maintain competent technical and managerial staffs have usually been in the van of price reduction. But the cost-lowering influence of large-scale production has been felt far beyond the walls of the plants which are first and most directly affected. With manufacturers purchasing in large quantities, and giving advance assurance to suppliers as to their needs, it has become possible for suppliers also to plan production on the most economical basis.

The report emphasizes the fact that large companies are needed only at certain strategic points in the industrial system. But the very existence of these large companies creates special opportunities for small specialized concerns whose operations are complementary to those of the big concerns. Many small enterprises have been able to keep at a more even level of operations because of selling their output to larger corporations. The financing of small plants by local banks and other sources also has been facilitated by the fact that the plants have sales contracts with large corporations.

The percentage of the nation's industry controlled by "giant" corporations was found not to have increased perceptibly in recent decades, despite the merger movement of the 'twenties. The report of the study places about 40 per cent of industrial output under such a head, which is about the same percentage as around the turn of the century.

Today's big combinations were formed largely for the purpose of effecting economies and promoting efficiency, and most of them actively  
(Turn to page 105, please)



Aemo

### TO SHATTER

his own records on the Bonneville Salt Flats, Utah, Ab Jenkins is completing the racing car pictured here. Jenkins, who now holds all automobile speed records from 10 to 1000 miles, is shown at the right with Augie Duesenberg inspecting the 12-cylinder, 665-hp. Curtiss-Conger airplane engine that is expected to give the new car a speed of 225 m.p.h. and 275 m.p.h. when supercharged.

### ... slants

INTEREST was aroused at the Eighth International Road Congress in The Netherlands over experiments in the use of rubber in road surfacers. Both alone and in a mixture with various types of bituminous material, rubber or rubberized road surfaces have been tried with success in Netherlands Indies, states a report to the Commerce Department

from the American Commercial Attache at The Hague.

**MOTOR BOAT** construction has shown substantial gain throughout the United States during the first five months of 1938. More than 15,000 pleasure and commercial craft have been added to the nation's fleet in this period, estimates the National Association of Engine and Boat Manufacturers.

**SPEEDBOATS** and runabouts of American manufacture (formerly in demand in Sweden) have given way to Swedish-made craft which imitate the U. S. models, according to the current issue of "Commerce Reports," the official foreign trade publication of the Bureau of Foreign and Domestic Commerce.

#### Federal's June Sales 10% Ahead of May

Final reports for the month of June show sales of Federal motor trucks 10 per cent ahead of the corresponding figure for May, according to K. M. Schaefer, general sales manager. The volume was the best for any month since March.

R. W. Ruddon, president of the Federal Motor Truck Co., Detroit, announced that the factory would continue to operate on a four-day week throughout the summer months to meet the production demands created by the sustained sales volume.

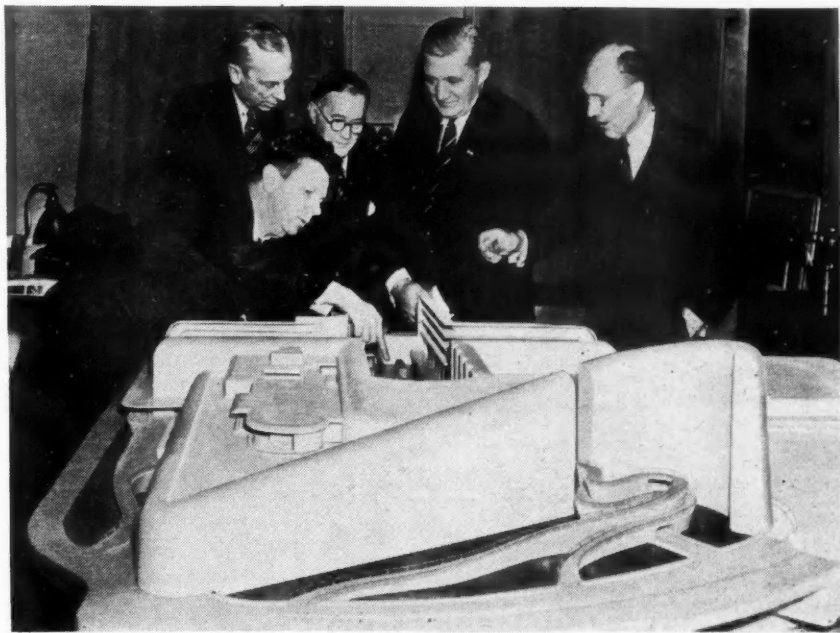
#### New Stratosphere Engine Invented in Sweden

An aircraft engine designed especially for stratosphere flying has been invented by a Swedish engineer, according to a report to the Department of Commerce by the office of the American Commercial Attache at Stockholm. Exploitation of the engine has been taken over by the Swedish Invention Corp.

The announcement states that the engine is designed for operation at altitudes ranging from approximately 39,000 to 59,000 ft. and is expected to give the plane an air speed of about 465 m.p.h.

The engine is described as a 12-cylinder, inverted V model, which operates at 1900 normal r.p.m. Under normal flight conditions, the engine is claimed to be capable of developing from 800 to 900 hp. The pre-compression problem is said to have been solved by an advantageous combination of specially constructed compressors invented by the engineer.

## "... Come to the Fair"



**"DRAMATIC** visual demonstration of how progress in transportation is related inseparably to progress in civilization," is William S. Knudsen's description of the General Motors exhibit planned for the New York World's Fair. "The exhibit," says GM's president, "will present a living panorama of what traffic control methods and automobile transportation on the superhighways of the future may conceivably be like." Executives of GM are shown above as they view a model of the exhibit, designed by Norman Bel Geddes. Mr. Geddes, left foreground, explains his creation to Alfred P. Sloan, Jr., chairman; Richard H. Grant, vice-president; William S. Knudsen, president; and Charles F. Kettering, vice-president in charge of research.

**STORY OF RUBBER** from the time it is gathered as latex on Firestone plantations in Liberia, West Africa, until it becomes the finished product will be portrayed by dioramas, historical pageants, and scientific demonstrations in the New York World's Fair exhibit planned by the Firestone Tire & Rubber Co. The exhibit will include a full scale tire factory in operation producing a finished tire every four minutes, and a life-size reproduction of a fully equipped farm. Shown below inspecting a model of the exhibit are: left to right, Raymond C. Firestone, Russell A. Firestone, Grover A. Whalen, Harvey S. Firestone, Jr., Leonard K. Firestone, and Roger S. Firestone.



## Ourselves and Government

*A weekly check list of legislative, executive and judicial actions affecting the automotive industries. First appeared in June 25 issue, p. 831.*

*Corrected to July 21*

### CONGRESS

Adjourned June 16, sine die. All members of House and 36 Senators retire or face election in Autumn.

#### Legislative Legacies

**MONOPOLY INVESTIGATION.** Passage of O'Mahoney resolution (S.J. Res. 300) set up 12-member temporary National Economic Committee of Congressional and departmental representatives to investigate monopolistic practices, concentration of economic control and to recommend anti-trust law revision. Six executive departments—FTC, SEC, Justice, Commerce, Labor and Treasury—are proceeding with their respective inquiries, to be laid before the full committee in the fall. Congressional members are taking a back seat momentarily, with many of them leaving Washington. Public hearings tentatively slated for September.

**AIRLINES.** The five-man Civil Aeronautics Authority, empowered to exercise broad administrative and regulatory powers over air commerce under the McCarran bill (S. 3845) recently passed by Congress, held its first meeting last week, preliminary to organizing the new bureau which expects to draw its personnel from existing agencies heretofore handling various air commerce problems. A third member of the Air Safety Board has not been appointed by President Roosevelt.

**WAGES & HOURS.** Signed by President June 25, becomes effective Oct. 24, and provides for an administrator who will appoint Industry Committees to hold hearings and recommend minimum labor standards for specific industries. President Roosevelt has named Elmer F. Andrews, New York State Industrial Commissioner, to administer the law. Andrews, former civil engineer, will take over on or about Aug. 15. He is a New Deal Democrat, and is credited with having successfully fought for passage of New York's unemployment insurance, labor relations, minimum wage and workmen's compensation laws. The Labor Department's Bureau of Labor Statistics and Children's Bureau are doing preliminary work, pending establishment of a permanent wage-hour setup.

### DEPARTMENT OF JUSTICE

**MONOPOLY.** Federal Grand Jury in South Bend returned indictments May 28.

Bonds of \$2,500 each have been filed by 18 individual defendants connected with General Motors. No action so far by other corporations or individuals indicted. (See A.I.—Jan. 15, 1933. Last detailed report A.I.—June 11, 1933.)

### DEPARTMENT OF LABOR

**AIRCRAFT LABOR.** The next step under the proposed 60-cents-an-hour minimum wage under the Walsh-Healey Gov-

ernment Contract Law will be for the Board to recommend a minimum wage to the Secretary of Labor after duly considering the objections filed by interested persons. If the Secretary approves the recommendations the minimum wage will have to be adhered to by all aircraft manufacturers in order to qualify for Government business.

### WAR DEPARTMENT

Educational orders program, designed to familiarize industrial firms with the country's war-time requirements and facilitate industrial mobilization, expected to be fully under way by Sept. 1.

Surveying the country's electric power facilities in an attempt to learn what increases would be necessary to adequately take care of a rapid installation and expansion of factories in the event of war, the Federal Power Commission has been given a \$50,000 PWA allocation to complete the project, originally suggested by the War Department and started about two months ago.

### LABOR RELATIONS CASES

**FORD VS. N.L.R.B.:** Last report A. I., June 25, p. 828. No new developments.

N.L.R.B. has issued order against Schacht Rubber Mfg. Co., Huntington, Ind., based upon March 31, 1933, stipulation agreement, requiring company to cease alleged discouraging of membership in United Rubber Workers of America, Local No. 130, to reinstate two former employees and compensate in whole six other discharged employees. The company manufactures mechanical rubber goods and according to N.L.R.B. annual sales approximate \$750,000.

N.L.R.B. has announced it will hear oral arguments on proposed findings by Examiner in the Douglas Aircraft Co., Inc., case on August 5. This case is among those which N.L.R.B. withdrew in order to reconcile it with rule of procedure laid down by the Supreme Court in the Kansas City stockyards case. The company had asked the Circuit Court of Appeals at San Francisco to set aside findings of the Board on the ground that the Board had denied the company a full and fair hearing. President Donald W. Douglas of the company charged that the N.L.R.B. order was an attempt to reinstate the CIO sit-down strikers found guilty of a felony.

### FEDERAL TRADE COMMISSION

**INVESTIGATION** under the Withdrawal Resolution (M.J. Res. 351) proceeding under direction of Dr. Francis Walker despite the fact the \$50,000 called for in the resolution was never appropriated by Congress. Officials deny that lack of funds is a handicap, pointing out that the FTC's regular staff is handling the inquiry. No new information available on

progress or duration of investigation which seeks to determine the alleged "extent of monopolistic price-fixing and other monopolistic practices engaged in by automobile manufacturers, etc."

**VS. GENERAL MOTORS** on question of forcing dealers to purchase parts and accessories from G.M. sources only. Hearings started July, 1937.

Dealer testimony recently taken in Texas. Hearings scheduled to be resumed in New York on July 26 have been postponed until August 16. Everett Haycraft is FTC attorney in charge.

**SIX PER CENT CASE.** F.T.C. cited Ford and General Motors in July, 1937, complaining of false and misleading representations in advertising prices of automobiles. Complaint alleges advertising 6 per cent charge on deferred payments by retail purchasers is misrepresentation because no provision is made for amortization. Case now in hands of trial examiner.

**F.O.B. PRICES** case vs. G.M. and Ford. Date for hearing expected to be fixed for some time in August. Complaint alleges advertising misleading because prices do not include standard equipment.

**FAIR TRADE PRACTICE** rules proposed for retail automobile dealers. This code, introduced at public hearings during last NADA meeting in Detroit (see A. I., April 30, 1938) is still under study by F.T.C. fair trade practice division headed by George McCorkle.

### DEPARTMENT OF AGRICULTURE

A new division of transportation, as provided in the 1938 AAA Act, has been set up by the Bureau of Agricultural Economics. Its job is to compile rail truck transportation rates, figures on traffic movements in agricultural commodities, transportation costs and methods of handling farm produce and to become a party to proceedings before the ICC and to intervene in the public interest. Ralph L. Dewey, former Federal Power Commission and Commerce Department attorney, heads the new division, assisted by James C. Nelson, former ATA employee and chief of the statistical and research division of the Washington State Department of Public Service. Although still in the initial organization process, the division has received several rate protests from widely scattered farm groups.

## Labor

### Warring UAW Factions Press for Support of John L. Lewis

Question of the week in the muddled internal affairs of the United Automobile Workers Union was whether John L. Lewis, CIO chief-tain, would intervene to bring about peace between warring factions or whether he would continue his hands-off policy.

Shortly after the forces opposing Homer Martin, UAW president, had scored a victory in the Detroit district council by voting to send a committee of locals' presidents to Washington to request Lewis' intervention and Washington dispatches had indicated that the CIO leader was preparing to step in, another committee of presidents was named by Martin supporters to call on Lewis to request his non-intervention. Up to the present there has been no



Globe

**NOT** a monster centipede, but John R. Cobb's Railton car being transported by English workmen. The car arrived in the United States this week, and Cobb, who is expected to arrive here Aug. 2, will meet it at Bonneville Salt Flats, Utah, where he will make his bid for the land speed record.

## Advertising News Notes

definite indication as to whether he would step in or stay out.

Meanwhile the Martin administration added new fuel to the flames by appointing administrators for three strong locals and seizing their records and funds. The unions affected were the Allis-Chalmers local in Milwaukee, the Norge local in Muskegon, and the Tarrytown, N. Y., local, each of which had indicated in one way or another that it was friendly to the anti-Martin forces. The union's constitution, according to Martin followers, permits seizure of records and funds when appointment of administrators is necessary, but in Milwaukee this action is claimed to have precipitated new resentment which would result in an 85 to 15 division against the administration. Officers of the local were also reported to have requested criminal prosecution of the administrator for the manner in which its offices were entered.

### Willys Cuts Prices on All Passenger Car Models

Price reductions up to \$26 on the Standard Coupe, and ranging throughout the line, were this week announced by Willys-Overland Motors, Inc., to cover current and future production of 1938 cars at the factory and to be immediately available on all Willys passenger cars in dealer stocks throughout the country.

The new prices bring the price of the Willys standard coupe model, delivered at Toledo, but not including Federal or State taxes, down to \$499. Sedan models are substantially reduced with a \$10 price cut made on the popular de luxe four-door sedan model.



**GEORGE S. ROGERS** has organized G. S. Rogers & Co. which resumes and extends the activities of G. S. Rogers & Associates, a Missouri corporation once large in the national picture as manufacturers and distributors of processing materials used in the metal-working industries.

**WILLIAM C. SIMPSON** has been appointed manager of sales for the newly-opened sales office of the Lukens Steel Co. in the Gulf Building, Pittsburgh.

**KARL BROCKEN**, widely known in the automotive industry, has become associated with Brooks Stevens, Milwaukee, as an associate designer in automotive, industrial and household equipment. He has participated in the design of the Dusenbergs, Cord,

Chevrolet is now expanding newspaper advertising to finish up the summer with extra drive.

The old technique of colored slides used in the early days of the movies is staging a comeback in many theatres today with educational "shorts." J. Don Alexander, president of Alexander Film Co., New York, stressed the theory that one minute or less of "commercial" was most desirable for advertisers in a talk at his sales convention in Colorado Springs, Colo., recently.

Standard Oil Co. of Louisiana, in a series of institutional advertisements by McCann-Erickson, Inc., New York, discusses the company's labor policies from a number of angles. Large photographs are used, stressing better wages, security for older employees, and other ideas of broad public interest.

Chevrolet's special house organ for dealers, issued over the personal signature of William E. Holler, sales manager, now has a name which everybody believes will stick—"Chevroliet." Starting as "The Torch," it took only one or two issues to discover that some other organization had adopted that name previously for its publication. The book was rechristened "The Chevron" and once again it was discovered that others had priority. Then it came out as "You Name It" with readers invited to mail in their suggestions. "Chevroliet" was adopted because it was suggested more often than any of the other thousands submitted.

Chevrolet's radio puzzle contest winners will be announced July 25 by the judges, including Clare Wight, *Automobile Topics*, and Chris Sinsabaugh, *Automotive News*.

Filling station "hostesses" are giving alarm to the union. In Milwaukee, employment of eight more attractive girls by Paramount Gas & Oil Co. chain brought sharp protests from the Gasoline Employees' Local, which wants them to work only as cashiers—if at all.

Business men in more than 400 cities have pledged their participation in the National Salesman's Crusade, George W. Mason, president of Nash-Kelvinator Corp., has announced. The idea, first launched with the cooperation of the chamber of commerce and other business groups in Lincoln, Neb., has been gaining momentum throughout the country. W. W. Blees, vice-president and general manager of Geyer, Cornell & Newell, Inc., New York, is heading the promotion activities of the national

Auburn and Hudson motor cars, and until now has been associated with the Briggs Body Co., Detroit, as consultant designer for 1939 Lincoln, Ford, Chrysler and De Soto models.

**T. L. HUMES** has joined the staff of the American Bantam Car Co., Butler, Pa. Mr. Humes has been identified with the wholesaling of light cars for many years, having been engaged in importing English Austin and Fiat Cars, and in the distribution of American Bantam cars.

**FREDERIC R. SPEED**, formerly promotion engineer with the Ethyl Gasoline Corp., is now Detroit representative of Briggs Clarifier Co.

**L. M. VILES**, president of the Buda Co. for over 20 years, has been elected chairman of the board of directors. **J. S. DEMPESEY**, formerly secretary-treasurer, succeeded Mr. Viles as president. At the same time, **F. E. PLACE** retired as senior vice-president. An executive committee consisting of Mr. Dempsy and two operating vice-presidents, **R. K. MANGAN** and **E. D. CONANT**, will direct the affairs of the company.

movement, the aim of which is to lift the country out of the present depression.

### AGENCIES AND MEDIA

International Piston Ring Co., Cleveland, has appointed Vichok Advertising Agency to handle its advertising.

Industrial Acceptance Corp., Ltd., Montreal, has launched an advertising campaign designed to help dealers sell used cars and also assure the public that time-payment purchases are basically sound. Restrained, dignified copy, illustrated with pen and ink sketches, are being used in Canadian newspapers by Ronalds Advertising Agency.

### RADIO

Ford led all automotive advertisers in money spent for radio advertising for the first five months of this year, with a total of \$697,260 invested for time on the three largest chains, Publishers' Information Bureau, Inc., reports. Ford was twelfth largest user of broadcasting. Chrysler was eighteenth, with \$417,220, and Firestone was twenty-fourth, with \$253,594. General Foods led all advertisers with an expenditure of \$2,463,777 for the five months.

National broadcasting chains are elated at the prospective increases in summer radio business. Confirmed by a study of several hundred stations made by *Advertising Age*, which found that most stations are billing extra time this summer, the optimism of the big chains is due largely to day-time advertising. Volume on Southern stations reported from 10 to 50 per cent higher than last summer; West Coast volume is up 25 per cent; Midwestern states up 15 per cent, and Eastern stations indicate as much as a 30 per cent gain.

Spot radio broadcasts are finding more and more popularity with advertisers, Publishers' Information Bureau finds. During the first quarter, with only 139 stations reporting, 14 advertisers who spent over \$50,000 each for the quarter, totaled \$1,371,489 outlay for time alone. First among automotive accounts and third in the national group was Standard Oil of N. J.; Chevrolet was fifth with \$126,469, and Tide Water Associated Oil was twelfth, with \$55,425. Bulova Watch led all spot advertisers during the first quarter with \$206,002 for time.

### MEN

Richard E. Gauen is now serving as publicity director on the DeSoto account with J. Stirling Getchell, Inc., filling the vacancy left when Harry Frier was moved up to assistant advertising manager at DeSoto.

Jack Gormley, assistant Chevrolet advertising manager in charge of the Soap Box Derby, has already taken quarters in Akron in preparation for the derby finals which will be run off there on August 14. Ben Bernie recently gave the derby a plug on the U. S. Tire Co. radio program when he introduced his new song, "Soap Box Derby Day," on July 6.

Dayton advertising men and business executives joined in giving James W. Irwin, member of the executive operating staff of General Motors, a lively send-off at their Gridiron Dinner. James H. Davis, chairman of the G.M. operating board in Dayton, was toastmaster.

Carl Georgi, D. P. Brother & Co., was elected treasurer of the Adcraft Club of Detroit. Fred M. Trump is the new president, succeeding J. J. Hartigan, Campbell-Ewald Co., who with Howard O. Ward, Chrysler Corp., were made directors.

William K. Dingledine, copywriter, Charles W. Hoyt Co., New York, has been elected vice-president of the agency.



International

### HENRY FORD

explains the construction and operation of one of his early automobile models to Prince Bertil of Sweden who recently visited Ford's plant at Dearborn, Mich. The young prince, son of the heir to the Swedish throne, is in the United States with the royal party attending the tercentenary celebrations of the landing of the first Swede colonists on American soil.

## Goodyear Aiming for 24-Hour Week

*Continues to Thin Out Akron Factory Force to Realize Goal of Four-Day Six-Hour Shift Basis for 7300 Workers*

As the Goodyear Tire & Rubber Co. of Akron continues without interruption in its layoff program to reduce the factory force to a point where remaining employees can be put on a 24-hour weekly basis, a campaign "to secure public support" of the Goodyear local of the United Rubber Workers Union in its effort to have Goodyear postpone the layoffs and come to terms in the form of a signed agreement with the URW, has been launched in Akron. The publicity drive, which includes use of newspaper and radio advertising and personal contact with business firms in Akron, was launched as company and union representatives resumed their negotiations looking toward a possible contract. Meanwhile the new Goodyear Independent Employees Association continues to push its drive to have the National Labor Relations Board call another collective bargaining election at Goodyear with the new association opposing the URW on the ballot. The URW won collective bargaining rights by a 60-40 margin last August at Goodyear. Goodyear is the only major Akron tire company without a contract with the URW, Firestone and Goodrich having such pacts with the CIO affiliate.

"We are confident that public opinion in Akron wants the Goodyear situation cleaned up," stated C. E. Smith, secretary of the Goodyear CIO local, in announcing that petitions were being circulated among business men of Akron, petitioning

Goodyear to sign the union agreement. Simultaneously John House, president of the Goodyear local, announced that a formal union letter had been sent to P. W. Litchfield, president of Goodyear, asking that the company's layoff program be postponed and that the company speedily negotiate its pact with the union.

The layoff program, said to involve between 1200 and 1700 Goodyear workers, including many 15-year service men, will leave about 7300 on the Akron force, and it is the company's plan to put this force on a four-day six-hour shift basis, giving all such workers an average of 24 hours weekly.

House declared the layoff program violated terms of an agreement which he said Goodyear yielded to last November, namely that men with more than 10 years service would not be laid off if other employees were willing to share the work. He said it was the wish of the rank and file of union Goodyearites to continue a share-the-work basis rather than to enforce the layoffs of so many veteran employees.

The Goodyear union called a membership meeting for July 23 to hear the reports of solicitors of the petitions. At this meeting the next strategy will be decided upon. Union officials say they are hopeful of having rounded up by that time an overwhelming commitment of businessmen favoring a Goodyear-URW contract.

## Steel's New Price Plan

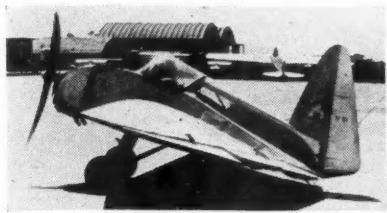
*Revised Basing Point System May Benefit Automotive Consumer*

In the four weeks that have elapsed since the momentous announcement of radical changes in the steel industry's time-honored basing point system, there has come to stand out from the confusion of conflicting interpretations and predictions grim determination on the part of each and every steel manufacturer, be he large or small, not to permit a competitor to encroach upon his outlets. If it isn't "Pittsburgh plus," it will have to be "Pittsburgh minus," is a frequently voiced thought among steel manufacturers these days, and this applies to all the uprooted basing points. The steel buyer, who in the first few weeks following the original and supplementary announcement did considerable worrying about having to shift his sources of supply, has found that the steel sellers, if not altogether, are relieving him of a large part of this burden through meeting competitors' prices, regardless of where the shipment originates. Unless artificial palliatives are again resorted to at this late day, the realignment in the steel industry is likely to proceed in an orderly manner. Aside from the largest factors, there are many others who look upon the steel market as a nationwide affair and who have the resources to maintain their standing in it, no matter how remote from their present plants points of consumption may be. It takes time to build a new steel plant, aside from the necessary investment, and there isn't likely to be an overnight crop of new branch mills, as some of the more imaginative forecasts in the last few weeks have intimated. Some of the smaller steel plants are preparing to specialize in descriptions of steel that lend themselves to specialization. That the few which could carry on solely because the larger producers "held an umbrella over them," will eventually be absorbed by more favorably situated producers, is likely, but the picture of mass mergers, that has been drawn by some extremists, is hardly justified by the outlook.

It is one of the banes of the steel market that so-called heavy products, such as rails and structural shapes, by reason of their venerable age compared with the lighter and higher-priced steels used in the manufacture of automobiles, continue to be looked upon as constituting all that there is to the steel market. Freight rates play a much more im-

## Automotive Metal Markets

*Better Buying of Sheets Believed to Indicate Early Pick-Up  
In Steel Consumption by Automotive Plants*



**PEE-WEE** plane poised for flight at the LeBourget airport in France. This "Simca" plane is said to be the smallest practicable plane in the world.

portant role in the cost of a structural steel at around \$40 a ton than in the much higher-priced steels used by automotive consumers. And so, while freight rates cannot be overlooked, they are not the most important element when automotive consumers seek an answer to the question where they can get the most in the way of quality steel for their money.

The chapter of the change in steel-pricing methods will not be closed until after definite information regarding the future of steel mill wage scales is available and this will depend upon the outcome of the impending Walsh-Healy Public Contracts Act hearings now impending. Many of the steel producers assume the attitude that those who announced price reductions and basing-point revisions shoulder the responsibility for securing wage scale adjustments, so that the industry can again operate in the black instead of the red.

That automotive consumers will benefit from the changes in the steel pricing system, aside from the price reductions, is the belief of many who formerly held a different opinion and who lately have analyzed the intricate problem more thoroughly.—W. C. H.

### Daniel Merrill Averill

Daniel Merrill Averill, 59, who retired a year ago because of ill health as general manager of the Kenosha and Racine factories of Nash Motors Co., died July 16, at his home in Racine, Wis. He was associated with Charles W. Nash for nearly 40 years, commencing as a clerk for the Durant-Dort Carriage Co., Detroit, while Mr. Nash was its president. He helped organize the Chevrolet Motor Co., with Louis Chevrolet, and in 1924 became associated with Nash Motors as general manager, after a year's leave of absence with Chevrolet.

While primary steel operations, reported by the American Iron & Steel Institute this week at 36.4 per cent of ingot capacity, make the best showing since the middle of last November, being nearly twice as high as in the closing week of 1937, the rate at which finished steel is being bought by consumers so far shows only mild improvement. This is true of virtually all steel consuming industries, but because the large automobile manufacturers have not yet come into the market with tonnage orders, automotive consumption is not even accorded credit for a distinct increase in buying by parts makers.

Encouraging to steel producers is slightly better buying of sheets. This is taken as an indication that steel will soon be consumed at a better rate in automobile plants, purchasing agents, following established custom, anticipating their sheet requirements because they take longer to finish than other descriptions of steel. At that, there has been a fair amount of small lot buying of carbon and alloy steel bars in the last ten days. A good deal of the statistical improvement in ingot operations results from the need by rolling and finishing mills and divisions of reserves of semi-finished material, which had been allowed to run too low, and the temporary trailing of finishing activities behind those of primary operations is as normal at this stage as their running ahead of ingot output when reserves of semi-finished steel are ample.

The perennial crop of advance rumors of new model cars calling for more steel per unit causes little perturbation among steel sellers, but developments with reference to the use of plastics in automobiles and the potential competitive status of this class of materials are coming in for serious attention of steel company technical and sales executives.

Somewhat more activity is reported by pig iron marketers in the buying of automotive foundries, many of which had virtually run out of reserves.

Buoyant demand in London caused the export price in the copper market to crawl up close to 10 cents, furnishing the main support for the domestic market, in which fresh buying at 9 cents for electrolytic was rather light. Brass mills, however, continue to work up consider-

able copper and unfilled orders for brass and bronze ingots are the highest since September of last year.

Tin displayed moderate activity during the last few days. Spot Straits was quoted at 43.10 cents at the beginning of the week, and on Tuesday rose to 43 $\frac{3}{8}$  cents, largely under the influence of the higher stock market. The premium of  $\frac{1}{2}$  a cent on end-of-the-year deliveries is well maintained.

Better demand is noted by secondary aluminum marketers, with prices holding steady.

Lead demand has turned rather dull. The price remains at 4.90 cents, New York. The Automobile Manufacturers Association recently revised its estimate of lead consumption in automobiles, now placing it at 36 per cent of the country's total lead consumption.

Interest in zinc offerings is dormant and the market a nominal affair.—W. C. H.

### 2400 South Wind Heaters a Day

Production of South Wind automobile heaters has been stepped up to 2400 a day, according to F. A. Hiter, vice-president of the Stewart-Warner Corp. Four times as many heaters had been shipped by mid-summer of 1938 as at the same date a year previous, Mr. Hiter reported.



Acme

**RECORD** of 67.40 m.p.h. for one mile was established recently by Britisher George Notley at Poole Harbor, Dorset, England, in the 175-hp. "Ventnor" type hydroplane shown. Notley also set a new mark of 54.76 m.p.h. for 24 miles.

## Letters

to AUTOMOTIVE INDUSTRIES

Editor, AUTOMOTIVE INDUSTRIES:

The figure of 4.1 per cent for the re-possession of new cars quoted by Mr. Arthur Fertig in his article in the July 9 issue of *AUTOMOTIVE INDUSTRIES* is confirmatory in these days surely of the sound mass financial judgment of the buyers of new cars.

But something obviously is wrong. And I would suggest two additions to the general policies of the industry:

The first is the quantity shipment of used cars to foreign ports, a real effort to free the domestic market for the purchase of new cars and to develop the habit of car usage abroad on a comprehensive scale. A car weighs a ton. Three thousand cars can be carried by a fair-sized freighter. Ten dollars apiece for quantity shipment would cover freight costs to any port in either South America or Asia. Foreign sales of used cars should be gone after hammer and tongs.

The second addition is the development of a "transportation" car for domestic sale. It must not be half-pint. It must be artistic, even gay, in appearance. It need not be low in gas consumption, because prospective customers are now the buyers of used cars, and these are, of course, gas-eaters. Top speed 55, cruising speed, 45. No gadgets except possibly a brute-force starter operated from the driver's seat. No front brakes. Four cylinders, preferably air-cooled. Four speeds ahead if costs are reduced thereby. Plain riding qualities, for the roads are much smoother now. No "safety" glass, because it is a moot point anyway whether cuts about the face are not to be preferred to skull and neck fractures. Closed models only. And the engine must be in front. It is one of the primary laws of business that innovations must start in the upper price brackets. The buyers of lower priced goods are by far the more conservative. And it would be a bit frightening to drive or to ride in a car without a hood.

In depression, the automobile people, like many others, have fought the trend by the offer of greater luxury. This is, of course, meritorious. But they should search for new markets as well, and they should also, by the offer of other types of cars, conform to the trend. Then manufacturers would not find themselves driven to become bankers. And then the possibilities of further growth and the further aid which the automobile industry may give to the world's civilization would indeed become practically unlimited.

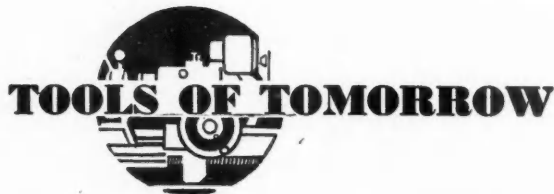
WILLIAM A. RHODES,  
New York, N. Y.

## 40 Years Ago

with the ancestors of  
AUTOMOTIVE INDUSTRIES

The Electric Vehicle Co., of New York, are building for the Fifth Avenue Coach Co., operating stages on Fifth Avenue, New York, an electric omnibus, which, it is said, will weigh ten tons and carry eight tons of storage batteries.  
From *The Horseless Age*, July, 1898.

July 23, 1938



Considerable work has been done by electrical manufacturers over the past year in establishing suggested standard ratings for given diameters and standard pertinent dimensions for built-in motor parts. According to T. R. Lawson, Westinghouse Electric & Mfg. Co., "There have been three outside stator core diameters proposed, namely, 8-in., 10-in., and 12.375-in. Using these three stator core dimensions as a base, overall dimensions for two, four and six and eight-pole ratings have been established, as well as the horsepower ratings which should be available on these various diameters. The actual dimensions which are to be standardized are the diameter of the stator core, the length of the stator stacking, the rotor bore, and the overall length of the coil extension."

Mr. Lawson told the 1938 Machine Tool Electrification Forum, held recently at the East Pittsburgh Works of Westinghouse, that the results of final voting on this question would be available in a very short time and definite standardized dimensions for built-in parts without frame, brackets or shaft will be published.

## Roller Conveyor

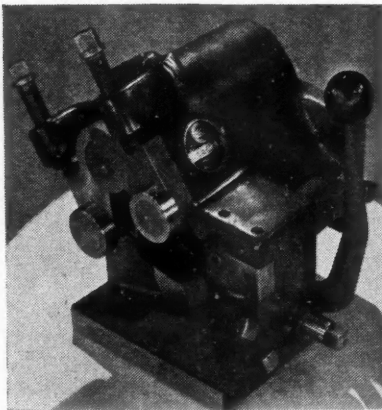
... Standard Conveyor Co. develops impact absorbing unit to remove loading shocks from roller bearings and shafts.

The Standard Conveyor Co., North St. Paul, Minn., has developed an impact absorbing roller conveyor to remove the loading shocks from the roller bearings and shafts such as occur with the conventional rigid mounted roller conveyor. Each

roller assembly is mounted in a set of steel arms pivoting on a shaft extending through the arms and frame. There are two coil springs—one for each arm—attached at one end to this through shaft and at the other end to a shaft on the set of arms supporting the next roller assembly.

When the load carried to each roller assembly exceeds the rated capacity for which the assembly is set, the excess load is transmitted to the coil springs. As soon as this excess load is absorbed from the first shock, the coil springs return the rollers to normal carrying level.

When heavy irregular commodities are carried, more than its share of the load would be imposed on the one roller assembly. With this conveyor, however, if that one assembly is called on to carry more than its share, the irregularities of the commodities causes the overburdened roller to depress sufficiently to distribute the load over the other rollers carrying the commodity. Long life is claimed for the bearings and rollers because of the elimination of direct impact and shock. Oftentimes savings in actual cost of the conveyor can be made because less expensive rollers and bearings may be used with this mechanism in carrying heavy loads.



A new single cutter bar turner for use on Nos. 3, 4 and 5 ram type universal turret lathes and 1L, 2L and 3L high production turret lathes. It is a product of the Gisholt Machine Co., Madison, Wis.

The new bar turner has many refined features said to make it an especially valuable tool for manufacturers doing bar work on turret lathes of the sizes stated above. As stated by the maker, the tool is built to meet the need for a rigid turner that will take high-speed cuts, maintain accurate dimensions and fine finish, and one that may be quickly set up for turning different diameters.

## Railroads Consider Reduced Rate On Automobile Freight

Seeking a greater volume of automobile freight, the principal railroads have inaugurated general rate studies, besides withdrawing a pro-

*Automotive Industries*

posed increase on upholstering materials and consenting to hearings on other matters involving proposals for higher shipping costs. The rate studies were decided upon at a meeting held by invitation of the Association of American Railroads to the Automobile Manufacturers Association, attended by traffic managers representing the automobile companies and vice-presidents of 16 railroads.

## Ford Dealer Plan

(Continued from page 95)

the United States is evidenced in the far-reaching measures being taken at the present time to build a stronger merchandising organization and to bring about closer and more mutually beneficial factory-dealer relations.

While no official statements are being issued concerning the new program, it is generally understood that the Company is trying to eliminate, as far as possible, the bad business practices which have proven to be so destructive to dealer success. In addition to this, the Company is making exhaustive market surveys to determine as accurately as possible their representation requirements. Special attention is being given to metropolitan areas and "ceilings" are being set for the maximum number of dealers they will have in multiple dealer points.

### Automobile Facts and Figures 1938 Edition Appears

The twentieth edition (1938) of *Automobile Facts and Figures* was published this week. Several records set by the automotive industry are revealed in the pamphlet.

Transportation of people and merchandise over the highways of the nation surpassed all previous years. Retail sales of trucks and buses exceeded the peak year of 1936.

Passenger car sales to consumers were second only to 1929. Registrations of passenger cars, trucks and buses marked a new high both in the United States and the world. Employment in automobile and parts plants was 16 per cent higher than 1929 with aggregate payrolls 10 per cent over that of 1929.

Consumption of gasoline during 1937 reflected unprecedented use of motor vehicles, and last year was the seventeenth consecutive year of increased taxes on motor vehicle owners with a total of \$1,548,990,000.

## "Closed Territory . . . More Sales"

*Says Pontiac's Simpson in Discussing 20 Months' Experience with "Twin Planks" Added to Dealer Contracts*

Results of Pontiac experience with protected dealer territory during the past 20 months were reviewed by C. P. Simpson, general sales manager, Pontiac Motor Division of General Motors Corp., in the July 1938

and authority for their adoption, were secured by the management of the Pontiac Division from the General Motors Corp.

With the end of the 1938 model run, we will have completed two full years of experience with both new contract features.

That the second clause is highly popular with dealers goes without saying. It gives the high overhead operator the extra discount to which he seems logically entitled, if only because he maintains the "showroom front" for the factory. And, by getting volume, which is the idea of the discount clause, he returns volume to the factory, and volume is the key to factory profit. This clause seems fair enough to all concerned.

As to the protected territory clause, I feel safe in saying that it is favored by the great majority of Pontiac dealers, after an honest and sympathetic test. It has, beyond question, improved dealer morale generally and has tended to allay suspicion of a neighboring dealer by the mere fact of setting up machinery for redress.

Perhaps, too, the penalty clause in the contract acts as a deterrent, for it is a matter of record that in the first 12 months of operation of the closed territory clause, with its attendant penalties, not more than a third of our national dealer body were involved in charges of violations in the full year.

It serves a less obvious purpose, too, in pointing the finger at the persistent violator, and such information is vital to a factory determined to build up quality representation through elimination of the chronic trouble maker. It certainly improves salesman morale.

So much for the dealer angle. From the factory standpoint, the effect of the sliding scale has already been mentioned: Extra dealer volume tends to offset the extra discounts paid by the factory to the high volume retailers.

As to closed territory, it is hard to see how, from the Pontiac factory experience, this clause could have had other than a positive effect on retail sales. In 1937, Pontiac made the best comparative national showing in its history. Even though outside strikes cut down our production for six weeks, dealers still made the second largest numerical gain in the

(Turn to page 106, please)



C. P. SIMPSON  
Pontiac's General Sales Manager

issue of the N.A.D.A. Bulletin. Mr. Simpson's review follows:

It will be recalled that, with the start of the 1937 model season, this Division of General Motors wrote two new vital clauses into its dealer contracts:

Protected territory, designed primarily to stop the low overhead suburban operator from sniping at the Main Street outlet, with its high overhead; and

A sliding scale of higher discounts based on volume. This second clause obviously is closely related to the first and is designed to give the Main Street store higher discounts, which are retroactive at the close of each year, to help him meet his higher operating costs.

These twin planks in a platform of quality dealer representation, which had been advanced by the present management even before they were assigned to the Pontiac Division, were the outgrowth of almost unanimous dealer opinion expressed at our informal monthly dealer conferences, which will shortly enter their fifth consecutive year. It might be added that the present twin planks of closed territory and higher discounts were originated,



Written by the Guaranty Trust Co., New York

There was a sharp decline in general business activity during the week ended July 9, which was mostly the result of the extended holiday period. The weekly index compiled by the *Journal of Commerce* stood at 62.6, as compared with 68.9 the week before and 93.3 a year ago. Nevertheless, an undercurrent of optimism exists in business quarters. Retail trade for the country as a whole ranged from 2 to 7 per cent above that in the preceding week and from 6 to 14 per cent above that in the corresponding period last year.

Railway freight loadings during the week ended July 9 totaled 501,103 cars, which marks a decline of 87,851 cars below those in the preceding week, a decrease of 177,945 cars below those a year ago, and a drop of 223,264 cars below those two years ago.

According to the Department of Labor, retail costs of food during the month ended June 14 stood at 80.2 per cent of the 1923-25 average, which marks a decline of 7.1 per cent below the level a year ago. Current food costs are 23.5 per cent above those in June, 1933, but are still 22.7 per cent below those in June, 1929.

Chain store sales in June rose sharply. The index compiled by the *Chain Store Age* stood at 105.5, as compared with 103.3 the month be-

fore. The volume of sales, however, was 7.5 per cent below that a year ago.

According to the Board of Governors of the Federal Reserve System, department store sales in June showed less than the usual seasonal decline. The Board's adjusted index rose from 78 to 81 per cent of the 1923-25 average.

Production of electricity by the electric light and power industry in the United States during the week ended July 9 was 10.3 per cent below that in the corresponding period last year.

Lumber production during the week ended July 2 stood at 48 per cent of the 1929 weekly average. Output was considerably below that in the preceding week, when production reached the high point for this year. New orders were at about the same level as in the preceding week, while shipments declined slightly.

Professor Fisher's index of wholesale commodity prices for the week ended July 16 stood at 81.7, as compared with 81.2 the week before and 80.9 two weeks before.

The consolidated statement of the Federal Reserve banks for the week ended July 13 showed an increase of \$1,000,000 in holdings of discounted bills. Bills bought in the open market and Government securities remained unchanged. Money in circulation declined \$70,000,000 and the monetary gold stock increased \$12,000,000.



The Safety and Hygiene Section, American Foundrymen's Association, Chicago, has published in pamphlet form a paper entitled "*Silicosis in the Foundry Industry*," by Dr. Leonard Greenburg, executive director, Division of Industrial Hygiene, New York State Department of Labor.

Toledo Associates have published a leaflet "*How Peace Came To Toledo*," by Edward F. McGrady, reprinted from the *Atlantic Monthly*, July, 1938.

The line of *squeeze riveters* made by the

Hanna Engineering Works, Chicago, is described in a new catalog issued by the company.\*

The Bonney Forge and Tool Works has just released its catalog No. 138 which covers its line of tools and tool cabinets.\*

The Electric Auto-Lite Co. has published a booklet entitled, "*The Physics of Ignition*."\*

**Air conditioning for lower welding costs** is the subject of a folder prepared by the Lincoln Electric Co.\*

A leaflet describes the new **heavy-duty, self propelled road grader**, the Diesel No. 12 Auto Patrol, announced by the Caterpillar Tractor Co.\*

A handbook of facts for the safety engineer with the title "*Stop Foot Injuries*" has been published by the Lehigh Safety Shoe Co.\*

A booklet, containing an illustrated re-

print of a paper presented by Dr. G. H. Spencer-Strong, of the Pemco laboratories, at the American Foundrymen's Association convention, has been published by the Porcelain Enamel & Mfg. Co. Title of the paper is, "*The Relation of Microstructure to the Enamellability of Cast Iron*."\*

A folder, describing its new **Hy-Draulic slotter**, has been released by the Rockford Machine Tool Co.\*

The Harold Andrews Grinding Co., Ltd., has published a second and amplified edition of its booklet on **cylinder wear**.\*

"**The New Atlas Shaper**" is described in catalog No. 30 issued recently by Atlas Press Co.\*

**Contour machining** is the subject of a bulletin released by Continental Machine Specialties, Inc.\*

Two new catalogs have been issued by the Landis Tool Co. One, No. J-38, covers the Landis 10 in. by 24 in. type C **hydraulic universal grinder**. The other, No. J-138, describes the Landis 12-in. type C hydraulic universal grinders.\* Landis Machine Co. has also released a folder entitled "**Here's One Way for Your Plant to Make a Profit Now**."\*

American Broach & Machine Co. has published a circular describing its type T, 3-way vertical **hydraulic broaching machine**.\*

Haveg Corp. has issued a bulletin on its cold setting **acid resistant cement**.\*

The Engineering Experiment Station at Lafayette, Ind., has issued Research Bulletin No. 59 entitled "**Testing Procedure, Motor-Vehicle Directional Signals**," by J. H. Karr. The 1937 General Assembly of Indiana adopted a public safety law requiring directional signals to be installed on specified motor vehicles and the State Safety Committee later adopted rules defining the vehicles coming within the provision of the law. The Committee adopted specifications for the approval of motor vehicle directional signals, and the Electrical Division of the Engineering Experiment Station of Purdue University was selected as the official testing laboratory for all signal equipment submitted for approval in Indiana. The equipment for tests was designed and constructed by the author of this bulletin.

The Blanchard Machine Co., Cambridge, Mass., has published a booklet "*Work Done on the Blanchard*" which contains over 100 illustrations with production data showing work done on the company's **surface grinding machines**.\*

The Cleveland Pneumatic Tool Co., Cleveland, Ohio, has just received from the press Bulletin "L" relating to its new No. 9 series of **rotary air drills, grinders, screw drivers, and nut setters**.\*

Installations using Bristol's system of **co-ordinated process control** are illustrated in a new bulletin published by the Bristol Co., Waterbury, Conn.\*

Reeves Pulley Co., Columbus, Ind., has issued a new 124-page catalog (No. G-384) covering its complete line of **variable speed control equipment**.\*

Three new publications have been brought out by the Kirk & Blum Mfg. Co., Cincinnati, Ohio, entitled "**Blower Systems for Woodworking Plants**," "**Dust Collecting Systems in Metal Industries**," and "**Fan Systems for Various Industries**."\*

Catalog No. 38 has just been issued by the Ford Chain Block Division of American Chain & Cable Co., Inc., Philadelphia. In addition to the regular Ford line of **spur geared, screw and differential chain hoists**, several additional items have been added, such as jib cranes and differential hoists with ball bearing mountings.

A new catalog and price list of its line of **tantalum carbide tools and blanks** has been issued by the Vascoloy-Ramet Corp., North Chicago.\*

Fairbanks **casters** are described in bulletin No. 53-20 recently brought out by the Fairbanks Co., New York.\*

A pamphlet issued by Repeal Associates,

Inc., Washington, D. C., is entitled "A Study of the Alcohol Factor in Automobile Accidents."

Diesel Equipment Corp., Chicago, has brought out a folder on fuel injection equipment.

\* Obtainable from editorial department, AUTOMOTIVE INDUSTRIES. Address Chestnut and 56th Sts., Philadelphia.

## Lauds Leadership

(Continued from page 96)

seek to broaden their market by giving the consumer more for his money.

The actual facts on rising real incomes during the past two-thirds of a century present a more optimistic picture than that seen by many persons who feel that the industrial system has not shown itself able to adjust its distribution of income to its increasing capacities of production. Between 1870 and 1937 the amount of manufactured goods which the average worker's weekly wage would buy was multiplied by two and a half, although the length of the working week was reduced about one-third.

The rate of gain in purchasing power, however, varied considerably in different periods. After making notable headway between 1870 and 1890, the movement slowed almost to a standstill in the quarter century preceding the World War. This was the first era of giant business consolidations, and the aggressive policy of price reductions adopted in more recent years by many organizations had not then got under way. After the War, vigorous improvement was resumed and continued throughout the 'twenties.

The report takes the position that it is essential for all business executives to follow a course as courageous and far-sighted as those followed by the leaders if the nation is to have the highest possible level of maintained prosperity.

Viewing the tendency toward transfer of more and more social-economic responsibility to government, the question is raised whether industry, by better handling its pricing approach, cannot carry the responsibility for full and continuous employment more effectively and at less cost than by allowing it to slip over into the hands of public agencies. The magnitude of the task, the remoteness and inflexibility of public agencies, and the susceptibility of such agencies to political manipulation, tend to impair efficient and economical functioning of the productive and distributive mechanism.

## TOP TENT

A Paris firm has placed on the market this "sleep on your car tent" which is carried in a container on the roof of the car. It is said two can sleep in the tent in comfort—without fear of erecting the tent on an ant hill. A ladder of tubular steel enables campers to mount to their "bedroom."



Acme

## AUTOMOTIVE ABSTRACTS

### Converting Coal Into Liquid Fuel

A new process for the conversion of coal into liquid fuel, known as the Pott and Broche process, has been developed to the commercial state in Germany through collaboration of the Stinnes and I. G. Farben interests. Powdered coal is treated with solvents, in several stages at increasing pressures, but at temperatures below that of dissociation. It is, therefore, virtually dissolved, and 85 to 89 per cent are converted into oil without leaving any noteworthy residues that might confront the motor fuels trade with new problems. The solvent employed, which is carried through a regular cycle, consists of a mixture of tetraline and phenols derived from the tar of low-temperature distillation, both of which are by-products of coke ovens.

A mixture of coal and solvent is subjected to pyrogenation in pressure vessels, the temperature employed being 700 to 800 deg. Fahr. The extract obtained in this way, after removal of the solvents, can be worked up into industrial and motor fuel oils. By hydrogenation it can also be converted into gasoline. — ATZ, May 25.

### New Piston-Ring Testing Machine

A new machine for testing piston rings to determine the pressure per square inch which they will exert against the cylinder wall and the ultimate bending moment they will

withstand has been developed by the Swiss instrument firm of Alfred J. Amsler & Co. of Schaffhausen. It is said to be free from the disadvantages of other methods of testing such rings, some of which put only one-half of the ring under stress, while others give results that are seriously influenced by friction between the ring and a flexible steel band encircling it.

The apparatus consists essentially of two parts, one of which serves to apply a bending moment that puts the whole of the ring under stress by closing up or opening out the ring, while the other serves to measure the moment thus applied.

The former consists of a ball-ended lever which can be turned round a fulcrum at the center of the apparatus and is fitted with a vice near its inner end in which one end of the ring is clamped. The other end of the ring is gripped in a similar vice mounted on a disk, the latter being fixed to the upper end of a calibrated elastic torsion rod located in a vertical tube below the disk. Both vices are free to move in a radial direction with negligible friction, so that they are able to adapt themselves to the deformation of the ring during the test.

The piston ring to be tested, which may have any external diameter from 2 to 6 in., is placed on the disk and its ends are clamped in the two vices. The ball-ended lever is then turned so as to open out or close up the ring, the torque exerted being transmitted through the ring to the

(Next page, please)

other vice and thence through the disk on which the vice is mounted to the vertical torsion rod. The twist produced in the rod is measured by fiducial lines on the disk, which moves over fixed scales surrounding the periphery, the scales being graduated to read the torsional moment in centimetre-kilogrammes, this being equivalent to the bending moment on the ring. — *Engineering*, June 24.

## "Closed Territory"

(Continued from page 102)

industry in 1937. So far into 1938, although our comparative standing in the industry is off somewhat, our price class performance is up to the high level of last year, which means that our dealers are getting their full, proportionate share of available business.

Since our first year of closed territory was the best in our history, there seems to be no evidence here to justify the assumption that closed territory may adversely affect retail sales. To the contrary it helps make more sales.

While minor adjustments have been made in the 1938 Pontiac dealer contract forms as compared with the previous year, the principles remain the same:

Dealers have exclusive selling privileges within certain well defined limits, usually the corporate limits of their home town. They are protected within those limits from all other Pontiac dealers within a radius of 200 miles. Any open points, without dealer representation, inside the 200-mile radius are happy hunting grounds. Metropolitan areas with two, three or more dealers are treated as a single dealer point on the logical assumption that their operating expenses roughly parallel each one's new car volume.

A dealer who cross-sells into another's territory is fined a flat \$50.00, which the company collects—generally—and refunds to the offended dealer. We refund whether or not we collect. If a car is bootlegged, the seller is fined the full amount of his discount and a flat \$50.00 is paid to the offended dealer. The difference between the full discount and the flat \$50.00 goes into a general fund which, if not absorbed by payments to dealers, on which the dictates of justice indicate no balancing fine should be levied, is prorated at the end of the year, or fractional year, to offended dealers according to their individual grievances.

In 20 months of the operation of this clause, less than 2000 complaints in the entire national Pontiac dealer organization have been made or adjusted. Nearly all of them are settled by the zone organization. An investigation usually discloses circumstances, not known to either complaining or complained-of dealer, which satisfies them of the justice of one or the other side. If either offending or offended dealer is not

satisfied with the zone adjustment, he has the right to appeal to the Central Office. His court of last appeal is the General Motors Dealer Relations Board headed by Mr. Sloan.

As already mentioned, there are instances where the factory pays the offended dealer, but fails to collect from the dealer complained of. That happens where there is a reasonable doubt of the guilt of the latter, and no dealer is made to pay unless the offense is clear-cut.

Rather than assess a penalty unjustly, or endanger the good-will of a retailer where a reasonable doubt exists, we prefer to pay and chalk up the \$50.00 to profit and loss.

In that way, we feel, can best be fostered the cardinal principle that only as its dealers are cooperative, contented and profitable can the factory also be successful in the end.

In the best part of two years of experience with both protected territory and higher volume discounts, there has been no serious discussion of discontinuing either. That is our own best comment on the value of these two clauses as a vital and necessary part of any long-range factory program based on quality dealer representation as an honestly administered and continuing activity.

## Calendar of Coming Events

### CONVENTIONS AND MEETINGS

National Petroleum Association Meeting, Atlantic City, N. J.	Sept. 14-16
Seventh International Management Congress, Washington	Sept. 19-23
SAE National Regional Fuel and Lubricants Meeting, Tulsa, Okla.	Oct. 6-7
SAE National Aircraft Production Meeting, Los Angeles, Calif.	Oct. 13-15
American Welding Society Meeting, Detroit	Oct. 17-21
SAE Annual Dinner, New York	Nov. 14
SAE National Transportation Engineering Meeting, New York	Nov. 14-16
National Safety Council Meeting, Chicago	Nov. 14-18
American Petroleum Institute Meeting, Chicago	Nov. 14-18
National Industrial Traffic League Meeting, New York	Nov. 17-18
Automotive Service Industries Show, Chicago	Dec. 5-10
*National Standard Parts Association Meeting, Chicago	Dec. 2-3
SAE Annual Meeting, Detroit	Jan. 9-13

### SHOWS

New York, National Motor Truck Show,	Nov. 11-17
New York, National Automobile Show,	Nov. 11-18
Pittsburgh, Pa., Automobile Show,	Nov. 11-18
Detroit, Mich., Automobile Show,	Nov. 11-19
Columbus, Ohio, Automobile Show,	Nov. 12-18
Buffalo, N. Y., Automobile Show,	Nov. 12-19
Chicago, Ill., Automobile Show,	Nov. 12-19
Milwaukee, Wis., Automobile Show,	Nov. 12-19
Minneapolis, Minn., Automobile Show,	Nov. 12-19
*Philadelphia, Pa., Automobile Show,	Nov. 12-19
*San Francisco, Calif., Automobile Show	Nov. 12-19
Boston, Mass., Automobile Show,	Nov. 12-19
Los Angeles, Calif., Automobile Show,	Nov. 12-20
*St. Louis, Mo., Automobile Show,	Nov. 12-20
*Elmira, N. Y., Automobile Show,	Nov. 14-19
New Haven, Conn., Automobile Show,	Nov. 14-19
Indianapolis, Ind., Automobile Show,	Nov. 19-25
Baltimore, Md., Automobile Show,	Nov. 19-26
Rochester, N. Y., Automobile Show,	Nov. 19-26
Montreal, Canada, Automobile Show,	Nov. 19-26
*Washington, D. C., Automobile Show,	Nov. 19-26
*Cincinnati, Ohio, Automobile Show,	Nov. 20-26
Newark, N. J., Automobile Show,	Nov. 26-Dec. 3
Denver, Colo., Automobile Show,	Dec. 5-10

\*Tentative

### NLRB Sets Aug. 2 for Arguments On Denver Dealer Cases

The National Labor Relations Board has set August 2 for arguments in Washington on exceptions to findings of the Trial Examiner in the Denver Automobile Dealer Association cases. The respondents, made up of 15 retail automobile dealers, members of the Association, maintain that automobile retailing is intrastate commerce and not interstate commerce as the intermediate report held. The contention of the dealers was overruled in Denver by the Regional Board, which on this and other points at issue, upheld the contentions of Capitol Automotive Lodge No. 606, International Association of Machinists. The regional board said that the Denver Automobile Dealers Association, Inc., admitted that its members purchase and sell products which are transported through states other than Colorado, and also the Board stated that some of the dealer members had business establishments in states other than Colorado.

The Board ordered the disestablishment of so-called company unions and recognition of the AFL affiliate as the proper union for purposes of collective bargaining.

# Just *Among* Ourselves

## Public Gives Industry Gold Star Award

IN its August issue, *Fortune*, as part of a widespread consumer survey, asks the following question: "Which of the four industries named has gone ahead the fastest in giving the public what it wants? (not referring to mechanical improvements). Automobiles? Air Transport? Radio Broadcasting? Motion Pictures?"

More than 43 per cent of the people asked this question by surveyors gave first place to the automobile industry. Radio broadcasting was a laggard second with better than 29 per cent. The totals varied somewhat between geographical and racial grouping of respondents, but this affected the other results more than those for automobiles.

This is an impressive showing for an industry which has never gone overboard on its public relations. But it should not be regarded too complacently. Public feeling about radio veers sharply in short periods, in spite of one of the most sensitive pulse-feeling setups in industry, which the radio naturally enjoys. The motion picture industry has gone conspicuously against public sentiment in some of its recent distribution policies. The air transport industry is high in public favor when a Hughes or a Corrigan are filling the front pages, much lower when the headlines flare with news of a cracked-up transport plane. The character of public reaction to this question, so far as the automobile industry is concerned, would probably vary downward with declining interest in automobile shows.

## Closed Territory Gains Ground

WE have never seen a more forthright statement of the advantages of "protected" dealer selling territories than that which C. P. Simpson, general sales manager of Pontiac, wrote for the July issue of the *Bulletin* of the National Automobile Dealers Association, which is reprinted verbatim elsewhere in this issue.

Chrysler, you will remember, is also going ahead with a defined territory agreement in its 1938 contracts, which are being written as fast as territorial agreements can be consummated. We've seen Chrysler bulletins in which the territory of a dealer is described with all the precision and much of the picturesqueness of an old land title.

It's a big and complicated job—this business of setting up protected territory scheme—and the details can't be worked out overnight. Where overlapping exists at present, many dealers forget that the other fellow is entitled to some consideration. There are some dealers whose definition of a "gyp" might read "any other dealer," and such dealers are inclined to be impatient with the rate of progress. Naturally, they make more noise than those who are more inclined to be pleased with the fact that progress is being made.

## Storm Raised By Fertig's Article

A COUPLE of weeks ago we printed an article "Car Sales Suffering From Too Many Hypodermics?" by Arthur Fertig. The reaction by letter, rumor, and word of mouth has been extremely interesting. Mr. Fertig has been called "crazy" and has also been compared with great chief justice John Marshall in his ability to succinctly analyze a complicated problem. One trade-association secretary wrote his colleagues that their education in the industry wouldn't be complete unless they read the article. It was the subject of directors' discussion at finance company conference. If interest in the article justifies it, we plan to publish a statistical discussion of the points involved. Meanwhile, if you haven't read the article (July 9 issue, p. 48) please look it up. If you have an opinion about it, please send it in to the undersigned. Send it by collect telegram if it will make you feel any better. And then you might read the article by Ray Prescott, which appears in this issue. Any statistical discussion of Mr. Fertig's thesis would have to include some of the points raised by Mr. Prescott.

—HERBERT HOSKING

By RAY B. PRESCOTT

**I**N November, 1922, there appeared in *AUTOMOTIVE INDUSTRIES* an article based upon statistics and analyses prepared by the writer, in which the opening paragraph stated that "Automobile registration will continue to make marked upward strides every year for some time to come. Its progress is basically dependent upon the growth of the population and, eventually, the registration curve will advance at about the same rate as the population curve."

Sixteen years now have gone by. The conclusions, as they appeared at that time, have been entirely borne out by the facts. The growth for the country as a whole for passenger cars and population is clearly shown on Chart I. It shows the extremely rapid annual increase in passenger car registrations from 1912 to the middle of the 1920's, and a gradual flattening since then, until now the annual growth very closely approximates that of population shown by the curve.

One can quite accurately trace the history from the above curves of passenger car registrations as shown by the dotted line, which is the actual yearly registration, and the full line, which is the computed normal curve. The dotted line falling below the full line during the war years and in the business depression of 1921, shows the effect of each. It also reveals the boom years of the 1920's and the results of the recent depression of the 1930's with the actual curve not quite reaching normal during the recovery of 1934-37. The flattening of the registration curve for passenger cars very definitely indicates that the motor industry has reached its period of stability in which 85 to 90 per cent of its annual market will be replacements. Every industry finally reaches this period in its evolution if it is successful. It is a period that requires careful planning so as to avoid over-selling the market in any one year by undue pressure, and suffering for it the next, and to avoid excessive expansion of plant and equipment that will require forced selling to earn a fair return on the investment or to break even. From this study it seems quite evident that the future growth is pretty well defined and the annual sales of cars could and should be maintained within carefully planned limits.

All of the nine geographical divisions of the United States and the country as a whole have enjoyed an unprecedented period of growth in passenger car registrations, but all have now reached the period in which any further increases in passenger car registrations will very closely approximate the growth of the population in that section of the country, as shown on the following charts for each section of the country. Of course, in some sections the rate of growth of registrations and popula-

tion will be closer than in others. But in every section the period of rapid growth is over. They have all passed the point of diminishing returns; i. e., into a period in which passenger car registrations and population continue to increase each year but at a decreasing rate.

This slowing down will be even more marked now than indicated at the time of the original article. In the period 1920-1930 the population of the United States increased 1.5 per cent a year. Now it is increasing at the rate of one-half of 1 per cent per year. This rate is just one-third of what it was in the period 1920-1930. It is due, primarily to the action of the quota immigration law that went into effect in 1924, restricting all immigration to a percentage of the population of each nationality as of a certain period. Along with this law there are other forces, both social and economic, that are tending to curtail the growth of population. Probably two of the most important are birth control, now making great headway in this country, and the economic difficulty of raising a large family. It is more than likely that the full effect of these forces tending to curtail population growth, has not been fully realized yet and that population growth in this country will see further slowing up over the next 10 or 20 years.

This declining rate of growth of

the population of the United States is of vital importance to the motor industry and to all of its future planning. It very definitely foretells the approaching limit of the ratio of the number of people per car. Let us assume that over the next 10-year period, the ratio becomes five persons per car and the population continues its present rate of growth of  $\frac{1}{2}$  of 1 per cent per year. This would mean that in 1950 there would be about 140 million people in the United States and, at 5 persons per

## Automobile Sales

car, about 28 million passenger cars. This is 2.5 million more than at the present time. The following table quite clearly reflects this approaching limit to the ratio of persons per car:

Table I

January 1, 1910.....	200	persons per car
" 1, 1915.....	43	" " "
" 1, 1920.....	13	" " "
" 1, 1929.....	5.2	" " "
" 1, 1930.....	5.3	" " "
" 1, 1935.....	5.6	" " "
" 1, 1938.....	5.1	" " "

Since 1929, when 5.2 persons per car was reached, there has been little or no change. Though the economic depression has greatly retarded the lowering of this ratio, it is still very doubtful whether the ratio would have gone below 5 persons per car for the country as a whole because, as shown in the following table, there still remains 60 per cent of the population of the country having a ratio of only 6.4 persons per car.

Table II

Ratio of Persons Per Car and the Relative Importance by Geographical Divisions		
Division	Cars per Person	Percentage of U.S. Total
New England .....	5.5	6.25
Middle Atlantic .....	5.8	18.88
East No. Central....	4.3	24.11
West No. Central....	4.3	12.60
South Atlantic .....	6.7	10.11
East So. Central .....	9.9	4.28
West So. Central....	6.4	8.00
Mountain .....	4.0	3.72
Pacific .....	3.5	12.05
United States .....	5.1	100.00

As can be seen in the above table

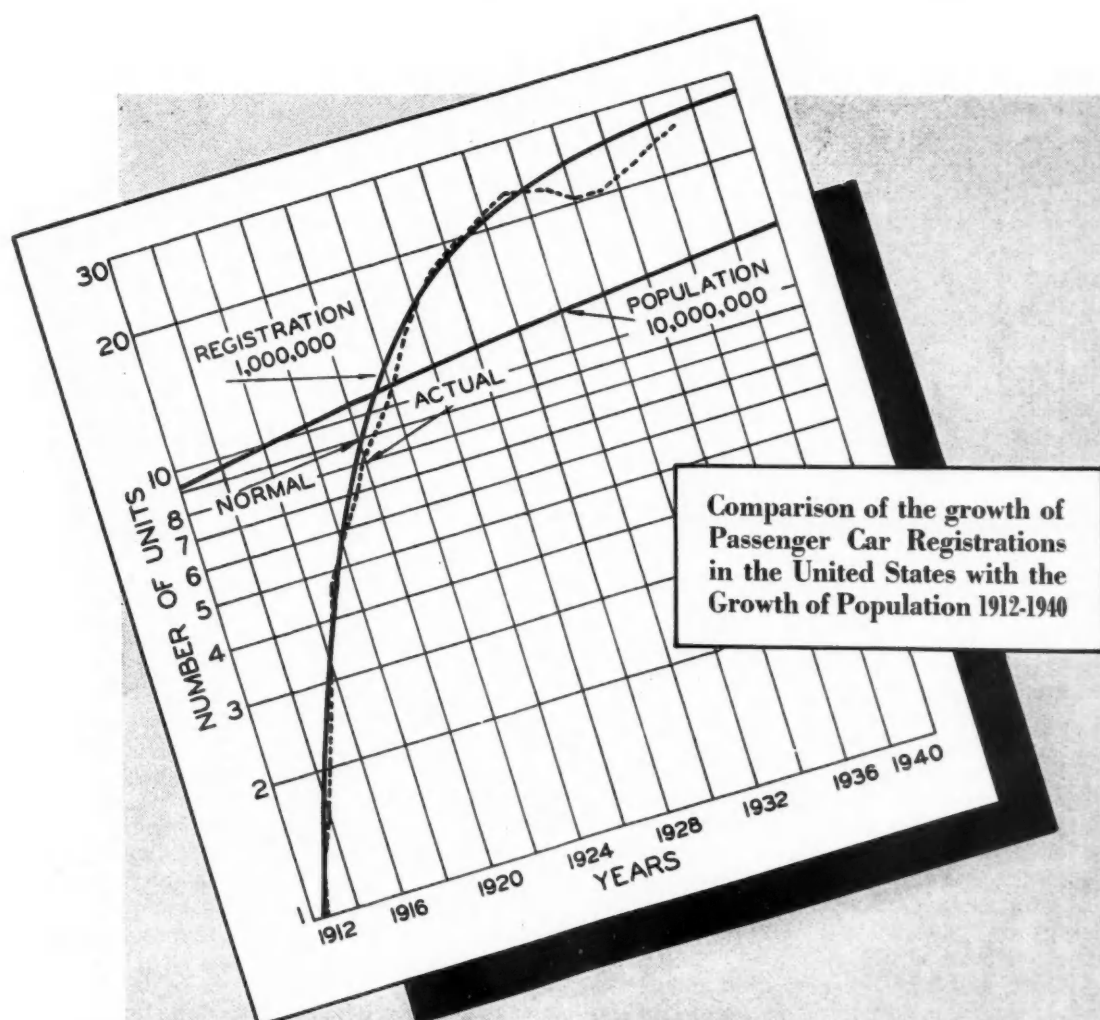
there is a wide variation in the ratio of registrations of passenger cars per person between the various sections of the country. There are also wide differences in the relative importance of each section of the country, but there is no correlation between the ratio of persons per car and the percentage each section is of the total. The East South Central States have 4.28 per cent of the cars registered yet they have only 9.9 persons per car, while the Mountain States have 3.72 per cent of the cars

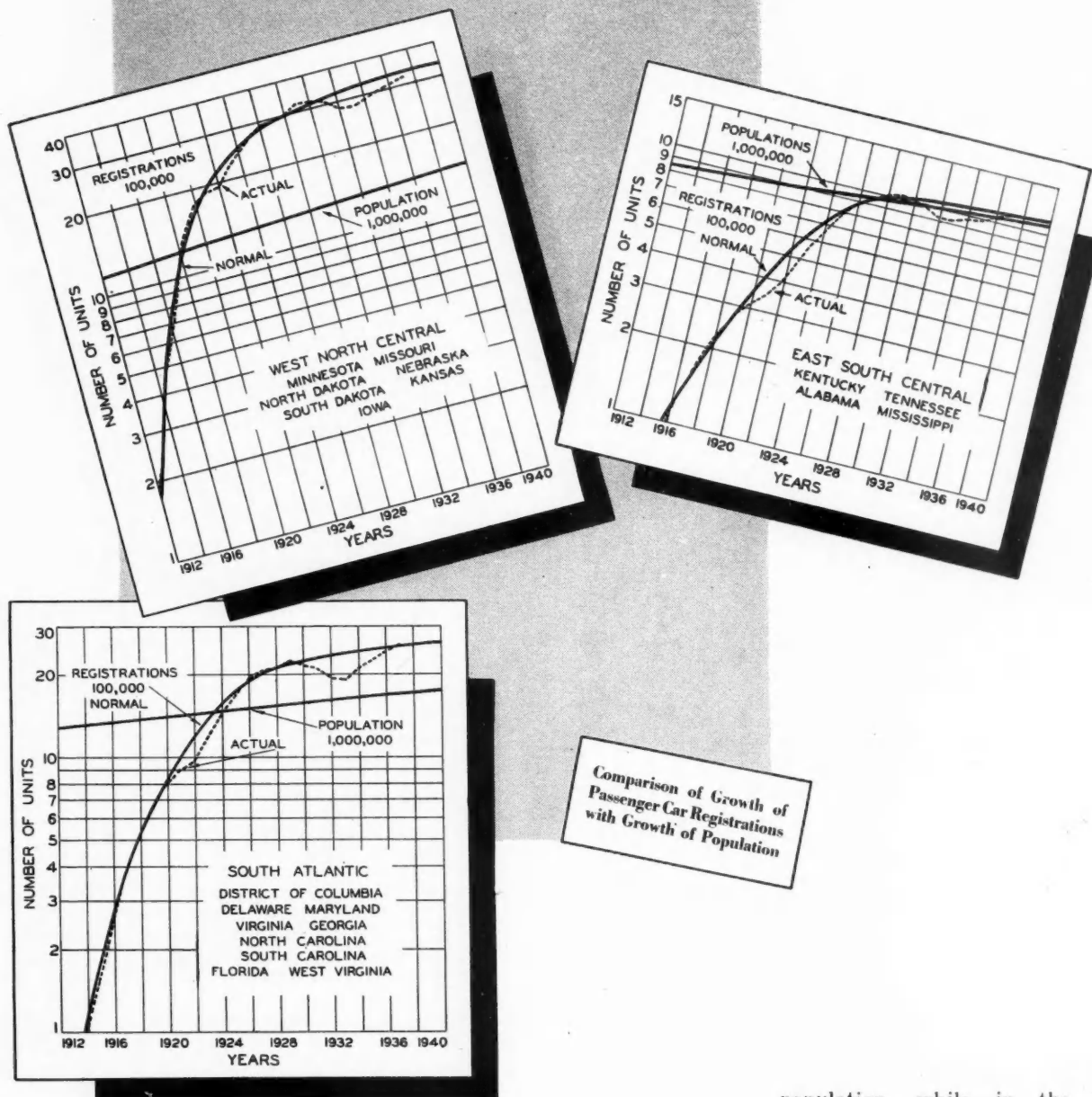
registered and 4.0 persons per car. The East North Central States have 24.11 per cent of the cars registered with 4.3 persons per car. This very clearly indicates that the relative importance of any section of the country has no bearing upon the ratio of the number of people per car and that every section of the country is an individual problem in respect to itself. In other words, just because one section, like the Pacific States, has reached a ratio of 3.5 persons per car, it does not follow that

other sections can be developed to the same ratio. The social and economic forces and the physical aspects of each section are in many cases so different that it would be impossible to expect them to develop or be developed along similar lines.

There is at the present time a well defined shifting of population and industry from one section of the country to another. This internal movement between sections of the country will cause some sections to experience population gains and

## Adjusting to Population-Growth Rate





others losses in excess of the normal population increases for those sections thus directly affected. As a result, the growth of passenger car registrations is going to be considerably greater in some sections than in others. Consequently it is going to be imperative for sales executives to shape their sales programs according to the population growth of each section, or even each State, if their sales problems require such procedure.

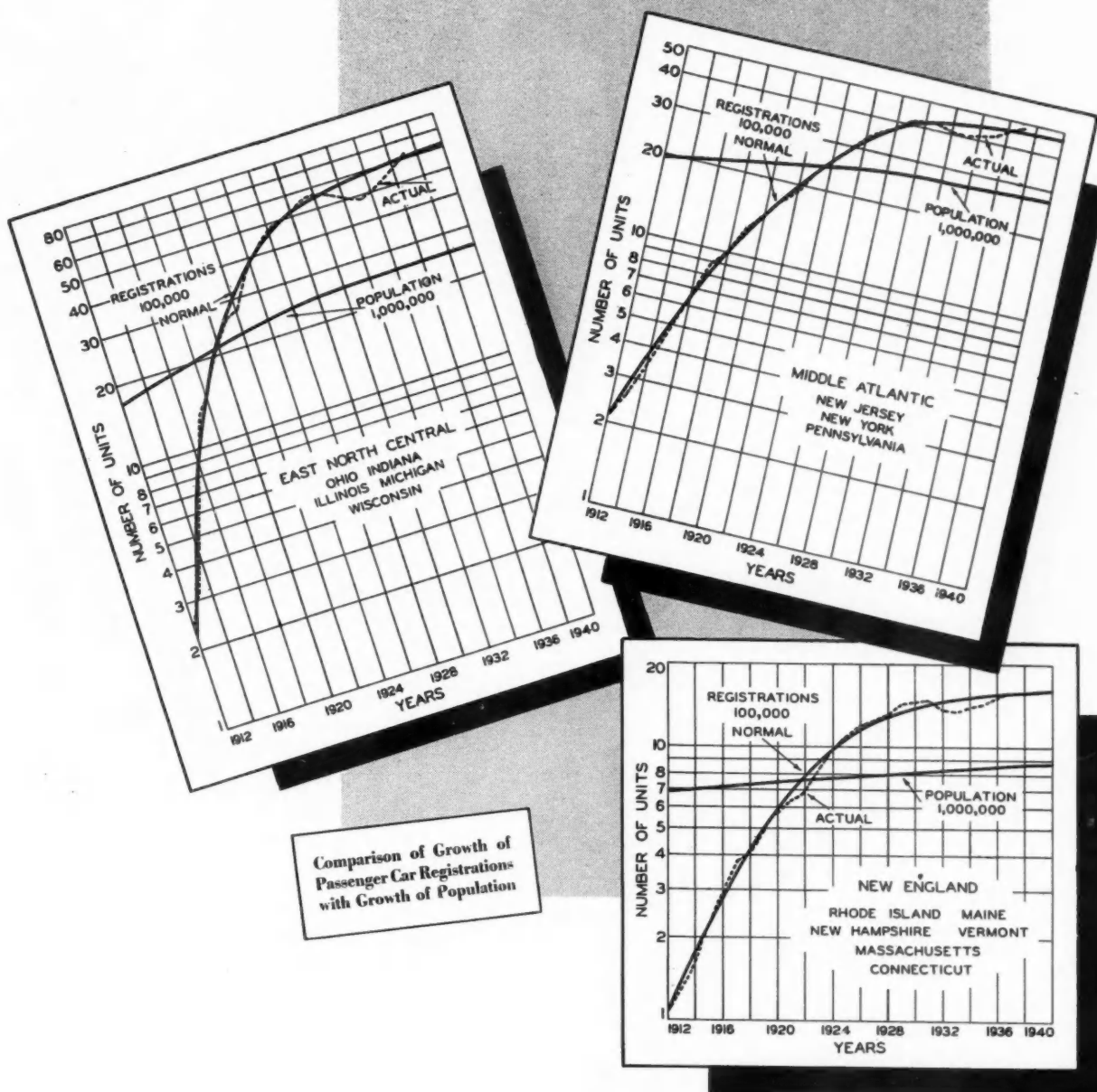
The trend of passenger car registrations in the nine geographical divisions is shown in the accompany-

ing charts. These charts should be studied from three points of view:

1. The actual growth of passenger car registrations shown by the dotted line in respect to the computed normal growth, shown by the full line.
2. The growth of passenger car registrations as compared to the growth of population since 1912.
3. The paralleling of the growth of registrations now with the growth of population.

It will be noticed that in every section of the country except the Pacific Coast, the trend of passenger car registrations parallels the trends of

population, while in the Pacific States, registrations are still increasing slightly faster than the growth of population. Even though the curve for registrations does parallel the curve for population, this does not mean that the rate of growth in every section is the same as the rate in other sections, because such is not the case. In using these curves, showing the growth of registrations and population in the various sections, to shape the sales policy of any particular company, the sales executives should not confuse the meaning of the accumulated registration curve with the annual sales curves for these various sections of the country. It should be borne in mind that the registration curve which shows the accumulated trend of car sales, and the annual trend of

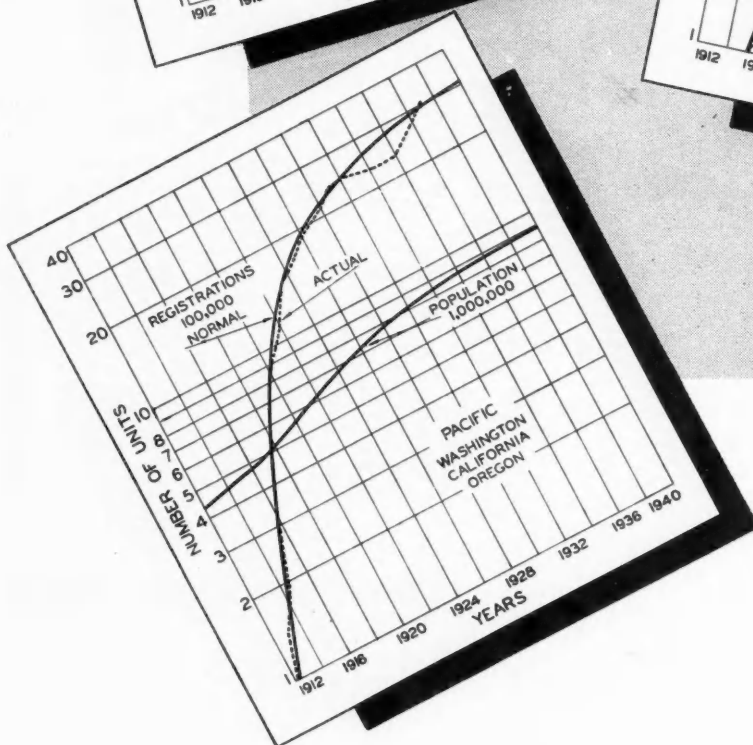
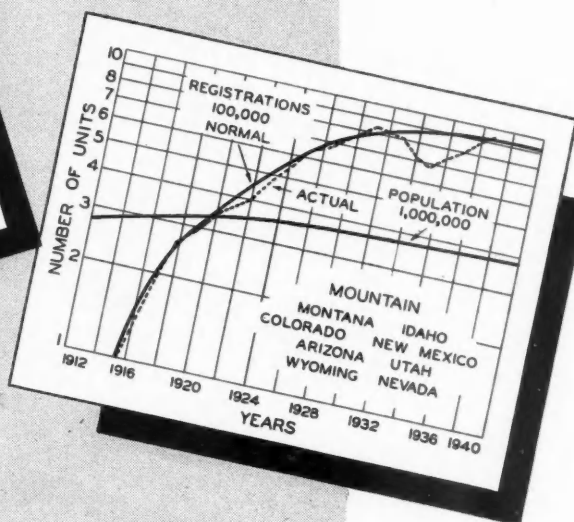
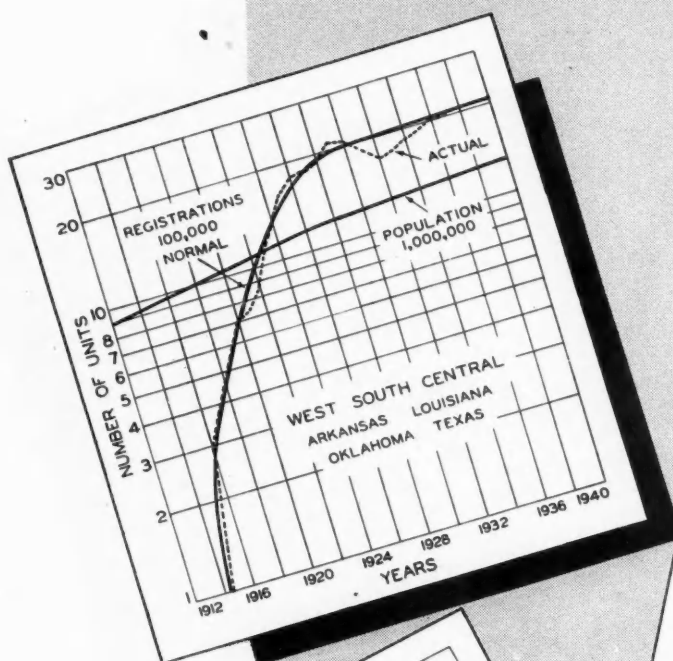


car sales, have quite a different significance. The registration curves shown in these charts do not indicate how many cars should be sold in any particular year in that section, but very definitely register the state of that particular market. In other words, it shows when a market reaches a saturation point that there is a condition in which all the possible buyers in that section now own a car and that any further increase in sales is contingent upon the population growth of that section. This use of saturation in the sales of cars follows very closely its use in chemistry, when a solution will normally absorb only so much of a substance without increasing the temperature or pressure. When the registration curve in any section of the country parallels the population curve it indicates that, unless the economic and

social condition of that population is materially changed, it will not, under normal conditions, absorb a much greater number of cars as to materially lower the per capita ratio. Of course, under high pressure advertising and selling, which includes excessive trade-in allowances on used cars and unsound time-payment arrangements for sales, sales in any section of the country might be increased for a year to lower the per capita ratio, but this procedure would react the next year and perhaps even the year following. So over a year or two, this per capita ratio, seemingly altered under high pressure, is right back where it was and the people, buying the cars under these con-

ditions have suffered through the foolish purchase of a car over their economic buying power and the industry has suffered by having sales seriously curtailed even to the point of going into the red. The industry is now suffering partly from overselling in 1936 and 1937.

Executives must realize that the hey-day of the motor industry is over. When it was not a question of how many cars could be sold in any one year, but how many could be built to satisfy the huge potential demand, everything was lovely. But that potential demand has been satisfied and now the main problem is to determine what the market will consume and build to that demand.



Comparison of Growth of  
Passenger Car Registrations  
with Growth of Population

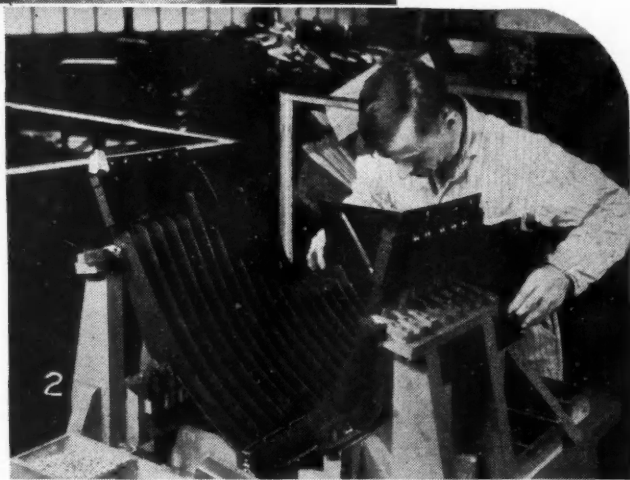
These curves, showing the relationship between registrations and population should be very helpful in solving this problem because the chart for each section very clearly shows the relationship existing between the normal growth of passenger car registrations and the growth of population.

To make best use of these charts the factory executives should study their own sales in each section of the country to learn how many cars are sold just to displace (not replace) a used car, and how many actually

go to virgin buyers (those who have never owned a car before). The sales executive should also plot the registration of his car to see how closely that curve approximates the total registration curve shown on these charts, and parallels the population curve. The executive may find that his registration curve does not follow the registration trend. It may run above it. If it does, his car has done better than the average. If it falls below, his car has failed to keep pace with the industry. If it very closely approximates the total

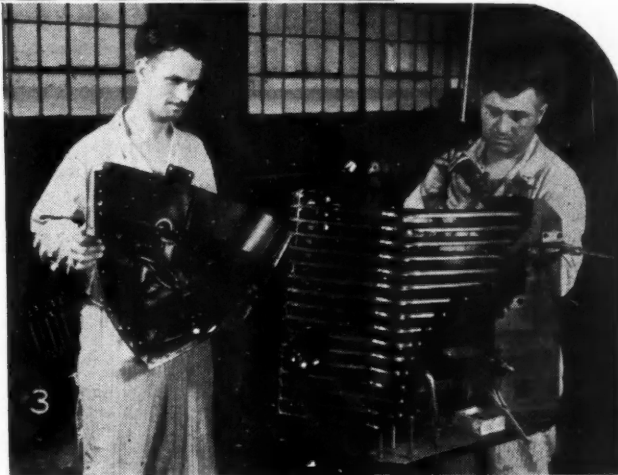
registration curve his sales have been normal in that section and by careful study of the facts he can learn where his car stands in every section of the country and determine the proportion of the market that just displaces the used car and the proportion that contains the virgin buyer. He should also be able to determine the replacements in each section; i. e., where the old used car is scrapped and is replaced by another used car. In other words, the industry has reached a phase in its evolution, as indicated by these charts, that requires exceedingly careful study and analysis of its sales possibilities in order to avoid over selling and allow it to continue on an even keel from year to year. Such a study should materially help in avoiding the wide annual ups and downs now experienced by this industry which make earnings unstable.

# Assembling Radiators for the Cadillac Sixty Special



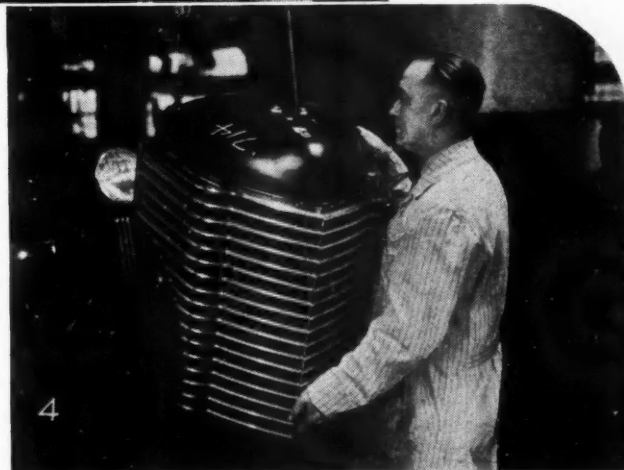
**1**—Handwork occupies a prominent role in the production of the Cadillac Sixty Special series radiator grille. Seventeen plated and highly polished fins are first set in the slots of the center bar.

**2**—The grille is then moved to a new buck where, nose down, it receives the space screws, side sheet metal panels and bottom valance.



**3**—Connections, some 48 of them, are tightened by power screw drivers. The workman at the left is ready to place the top shroud. Note the long horn projectors which Cadillac mounts this year perpendicularly between the grille and radiator core.

**4**—Here is the completed unit on the conveyor system that will carry it to another sub-assembly in the radiator department.



# Hydromatic Aircraft

AIRPLANE performance has reached a point where the range of pitch adjustment of existing variable-pitch propellers is no longer sufficient. Whereas the first "controllables" had a range of adjustment of only 4 to 5 deg., current types provide for up to 20 deg. adjustment, and projected types will need still more.

In addition to the requirements for additional pitch range, there has been a need in certain types of airplane for stopping the rotation of engines which may have failed in such a way as to render their continued operation dangerous. In some cases this has been accomplished by the use of friction brakes acting on the propeller shaft, but it can be done to better advantage by a change of the blade pitch. If the pitch angle of the propeller blades is rapidly increased to about 87 deg. at the three-quarter-radius point, rotation of the engines is stopped almost instantly, and the resistance of the idle propeller is reduced to a minimum. This adjustment is called "feathering."

To meet these new requirements, Hamilton Standard Propellers has developed the Hydromatic propeller, the design of which was carried out under the direction of Erle Martin, chief engineer. The first Hydromatic propeller was assembled and ready for test in the spring of 1936, nine months after the inception of the project. After the first tests, some slight modifications were made in the design, and since that time Hydromatic propellers have had more

than 500 hours of ground testing and more than 4000 hours of flight testing.

The pitch-control mechanism of the Hydromatic propeller is of the hydraulic type. It differs from the earlier design of hydraulic control by reason of the additional safety problem introduced by the feathering procedure. Some means of restricting the pitch range during normal operation had to be provided, so that the blades cannot be feathered except by the deliberate action of the pilot.

This problem was solved by taking advantage of the fact that the centrifugal force acting on the blades tends to cause them to go into low pitch. Engine oil which has been boosted to higher pressure by the constant-speed governor pump, is used to overcome this centrifugal twisting moment when it is necessary to increase the pitch. This oil pressure acts on a large piston, and the motion of the piston is transformed into rotary motion by means of a series of cam rollers acting on coaxial helical cams of opposite pitch slope. For the normal pitch range,

the cam follows a steep helical angle, so that the piston enjoys a high mechanical advantage. When the pitch reaches the maximum operating value, the slope of the cam becomes flatter, so that the mechanical advantage of the piston is insufficient to overcome the centrifugal twisting moments of the blades when the normal operating pressures are used. Thus, a maximum pitch limit is provided for normal flight conditions. If a considerably-increased oil pressure is supplied from some other source under the control of the pilot, the piston will overcome the blade-twisting moment, and the pitch will increase until the feathered setting is reached.

Adjustment toward low pitch is also accomplished by oil pressure, supplementing and augmenting the centrifugal force on the blades. Engine oil, under normal pressure, always acts on the opposite face of the propeller piston, and provides a "resilient force" opposing any tendency for a change to higher pitch. Whenever the constant-speed governor valve relieves the higher oil pressure on the other face of the

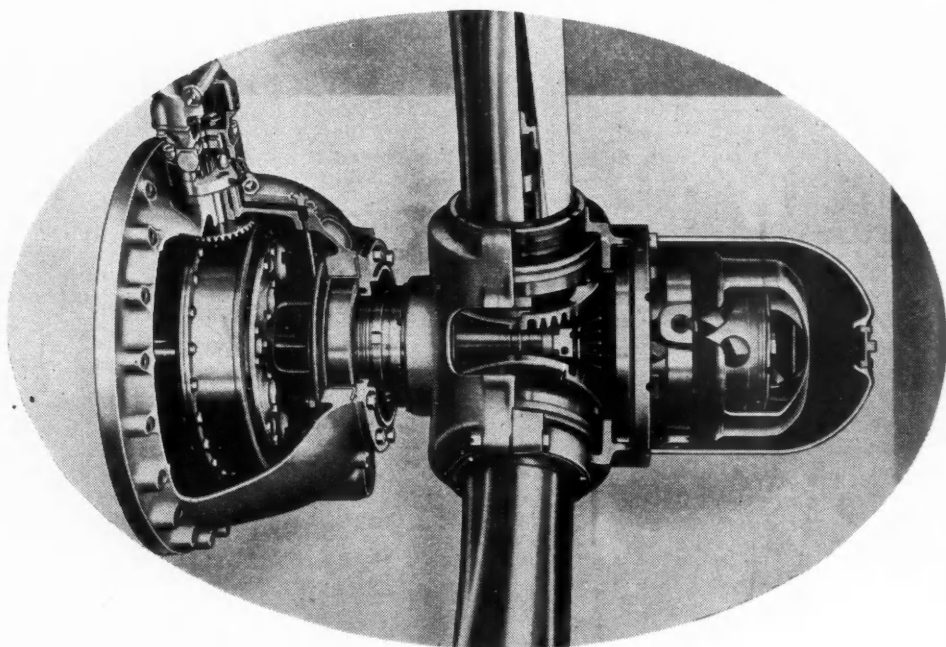


Fig. 1—Cutaway view of Hamilton Standard Hydromatic propeller and constant-speed governor installed in the nose section of a Pratt & Whitney engine

# Propeller

## *Has increased range of variable pitch for "feathering" in emergencies*

piston, this resilient pressure, together with the centrifugal force on the blades, moves the blades toward low pitch.

When it is desired to feather the blades, an auxiliary pressure-supply system is put into operation, as illustrated in Fig. 4. The pump is mounted between the engine oil tank and the constant-speed control, and sends oil under pressure through line *O* (Fig. 3) to the cut-out valve built into the base of the constant-speed control. The auxiliary system shown in Fig. 4 allows the pump to draw its oil from the engine oil tank.

The pump very rapidly builds up pressure in line *O*, disconnecting the governor from the propeller, and at the same time opening this pump line to the propeller by compressing the spring *P* in the cut-off valve. This "feathering" oil pressure is transmitted to the rotating propeller shaft past the oil-transfer rings *C* (top view, Fig. 3), through port *E* of the distributor-valve assembly, and out port *F*, to the inboard side of the piston *H*. The piston moves out under this pressure, and forces the engine oil, on its outboard side in the dome *G*, through ports *K* and *J*, into the oil-supply pipe *D*, and back into the engine-lubricating system. As the piston moves out, the blades move to a higher pitch, and the motion is finally stopped by the

rotating cam coming against an adjustable mechanical stop (not shown in the sketch), set for the fully-feathered position of the particular blade design being used. With all motion stopped and the feathering pump still functioning, the feathering oil pressure builds up until it reaches 400 lb. per sq. in., at which point a pressure cut-out switch opens the electrical circuit operating the pump, by de-energizing the solenoid holding the cockpit solenoid-switch in. With the blades feathered, engine rotation is stopped, and consequently the blade centrifugal twisting moment and engine oil pressure have dropped to zero, and the blades remain in the feathered position. The entire feathering operation occupies about 9 seconds.

To unfeather the blades, the pump is again started and permitted to build up a pressure greater than 400 lb. per sq. in., by holding the cockpit solenoid switch closed (Fig. 2). At 500 to 600 lb. per sq. in. pressure, the force at *Q* (at the base of the distributor valve in the propeller) is great enough to move the distributor valve out, compressing spring *R*, and the valve then moves toward the position shown in the bottom view of Fig. 3, disconnecting the engine oil system from the dome. The oil from the pump starts to fill up the dome on the outboard side of the piston.

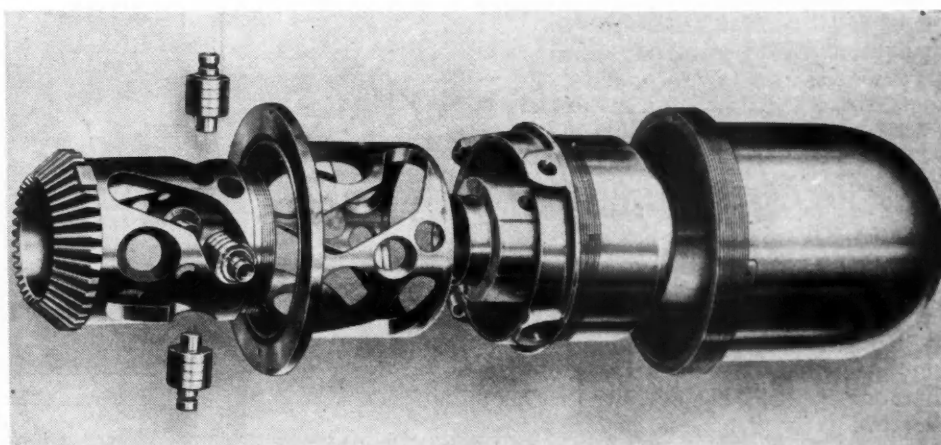
through ports *S* and *K*, as the distributor valve moves out, and this oil starts pushing the piston in, unfeathering the blades. At the same time the oil on the inboard side of the piston is forced out through ports *F* and *J* into the engine oil system.

The unfeathered propeller in an airplane moving through the air starts to "windmill." When the engine reaches a reasonable r.p.m., the cockpit solenoid switch is released by the pilot. The propeller continues to "windmill," cranking the engine, and it is thus possible to start the engine running again. The moment the feathering pump stops, the spring in the cut-out valve in the governor disconnects the feathering pump line from the propeller and places the governor back into the system, and the propeller runs again at the speed for which the governor is set by the pilot in the cockpit.

For normal constant-speed operation the Hydromatic propeller requires two simultaneous sources of oil supply, one being oil from the constant-speed control booster pump; the other, oil under normal pressure from the engine oil system. Referring to Fig. 3, oil from the constant-speed control pump *A* is permitted to enter the hollow drive-gear shaft *B* of the governor and to flow thence to the propeller shaft when the engine is turning faster than the speed for which the governor is set by the pilot in the cockpit. Governor oil is thus metered at the top port of the drive-gear shaft, and enters the rotating propeller shaft by means of the oil-transfer rings *C*. It then follows the same path described above, for the oil during the feathering operation, to the inboard side of the piston.

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Fig. 2—Principal parts of the dome-assembly of the Hydromatic propeller. From left to right these are: The rotating cam which is geared to the propeller blades; the cam rollers, the stationary cam keyed to the hub barrel, the piston, and the dome



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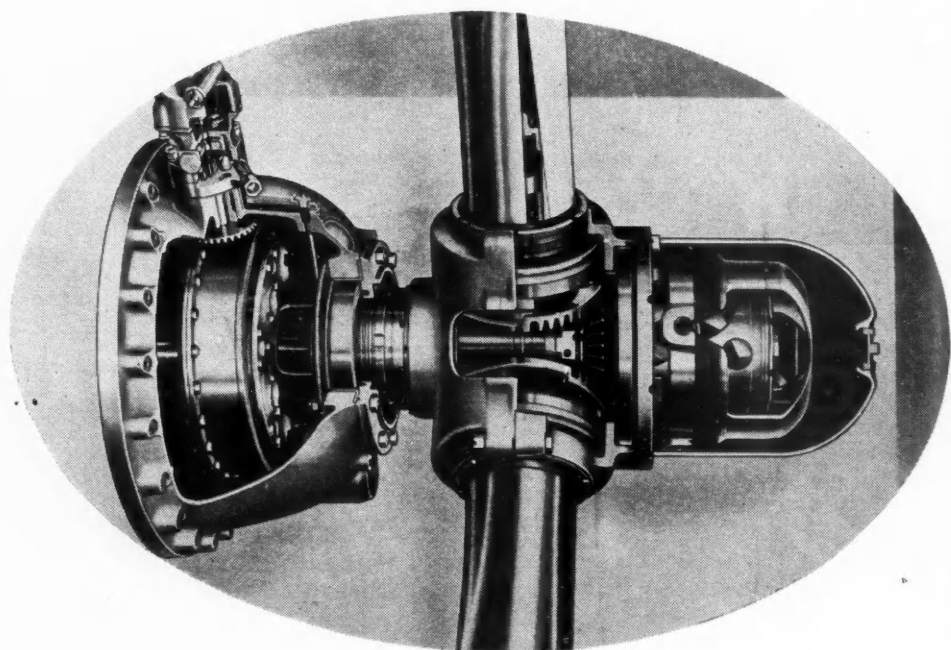


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To unfeather the blades, the pump is again started and permitted to build up a pressure greater than 400 lb. per sq. in., by holding the cockpit solenoid switch closed (Fig. 2). At 500 to 600 lb. per sq. in. pressure, the force at *Q* (at the base of the distributor valve in the propeller) is great enough to move the distributor valve out, compressing spring *R*, and the valve then moves toward the position shown in the bottom view of Fig. 3, disconnecting the engine oil system from the dome. The oil from the pump starts to fill up the dome on the outboard side of the piston.

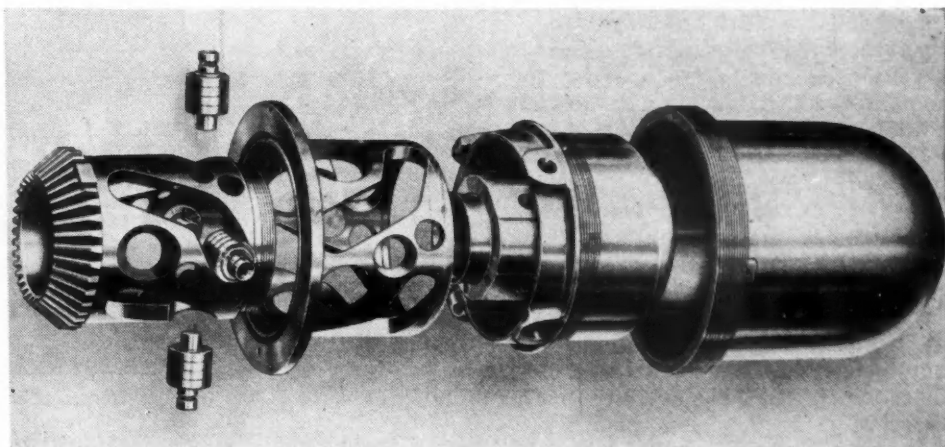
through ports *S* and *K*, as the distributor valve moves out, and this oil starts pushing the piston in, unfeathering the blades. At the same time the oil on the inboard side of the piston is forced out through ports *F* and *J* into the engine oil system.

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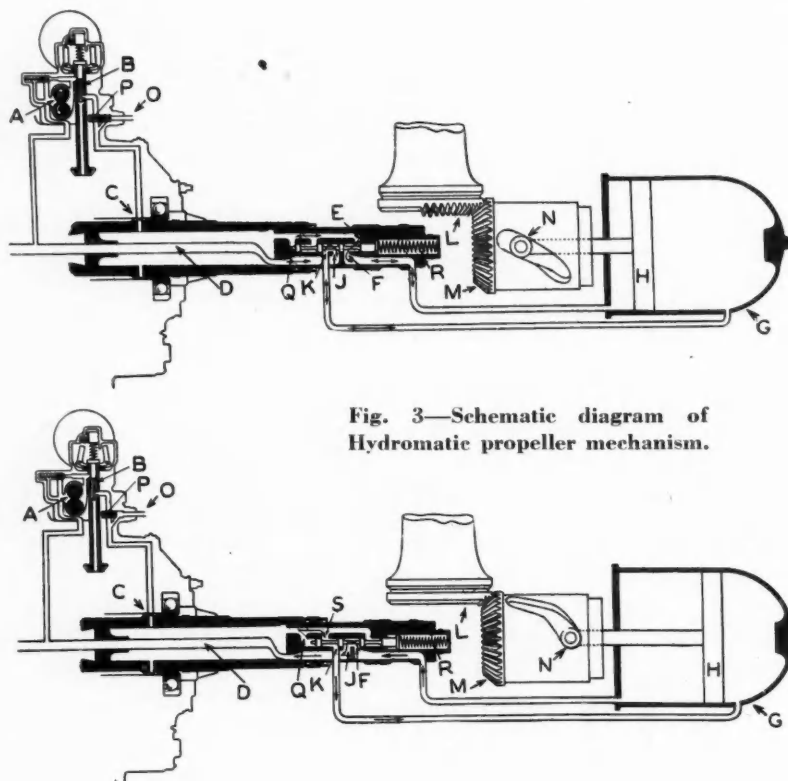


Fig. 3—Schematic diagram of Hydromatic propeller mechanism.

engine-lubricating system under normal engine-oil pressure enters the propeller mechanism through the supply pipe *D* in the center of the propeller shaft, and reaches the outboard side of the piston through ports *J* and *K*.

The governor-oil pressure builds up until it exerts a force greater than the sum of the forces which oppose motion of the piston outward into the front of the dome. These forces are:

1. Engine-oil pressure on the piston.
2. The net blade-twisting force consisting of the blade centrifugal twisting moment modified by the aerodynamic twisting moment.
3. Friction of the moving parts of the propeller mechanism.

The net blade-twisting force is transmitted from the blade gear segment *L* to the rotating cam *M*, and through the cam rollers *N* acting in the slots of the rotating cam, to the piston.

The blade centrifugal twisting moment tends to decrease the blade angle. It is the result of a couple consisting of the resultants of components of centrifugal force acting on the mass of the propeller blade on either side of the blade's longitudinal axis. The aerodynamic twisting moment is usually opposite in direction to the blade centrifugal twisting moment, being caused by the position of the resultant center

of pressure of the airfoil section of the blade in front of the center of rotation of the blade (the blade's longitudinal axis). In normal level flight, this aerodynamic moment is relatively small.

When the governor oil pressure builds up to the point where the force on the piston exceeds the sum of these three forces, the piston starts to move out toward the front of the dome, and engine oil in front of the piston is returned to the engine lubricating system. This outward movement of the rotating cam increases the pitch of the blades, and the engine speed is thus slowed down. As the engine slows down to the speed for which the constant-speed control is set, the pilot valve in the governor descends to the posi-

tion shown in the top view of Fig. 3, thus shutting off the top port of the drive-gear shaft and cutting off the supply of governor oil from the booster pump to the propeller. The oil delivered by this pump then returns through the relief valve to the engine, and the propeller runs on speed.

Should the engine r.p.m. fall below the speed for which the governor is set, the pilot valve in the governor descends still further, opening the bottom of the drive-gear shaft to drain. In normal propeller operation engine oil in the dome at the outboard side of the piston is always kept under pressure by the engine oil pump. This pressure acts as if a spring were placed between the outer end of the piston and the front of the dome, except that a constant force is being exerted regardless of the position of the piston. The blade centrifugal twisting moment, aided by this "spring" force, moves the piston inward, overcoming friction and the back pressure existing in pushing governor oil back through the governor to drain. As the pitch of the blades thus decreases, the engine speed picks up, and the pilot valve in the governor is raised, closing off the drain through the drive-gear shaft just as the engine reaches the speed for which the governor is set.

It should be noted that the relief valve in the governor is so interconnected with the engine oil system, that the former is held closed by its spring plus the engine-oil pressure on the relief valve, whatever this may be. Thus, the effect is to provide a maximum pressure differential across the propeller piston equal to the relief-valve-spring setting, and the effects of variations in engine-oil pressure in any one engine, or between engine types, on the operation of the propeller, are eliminated.

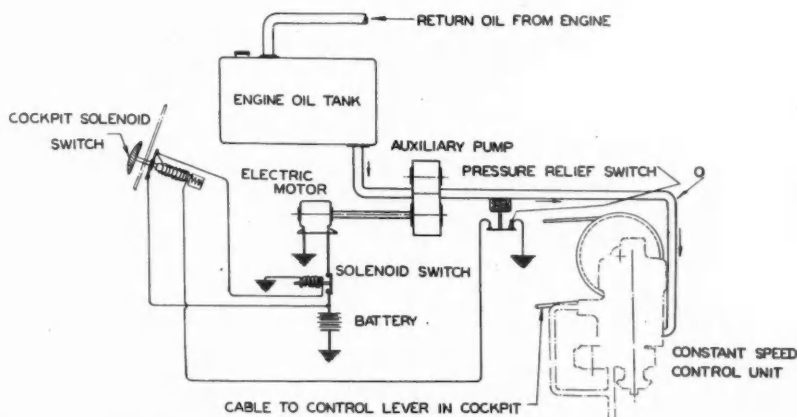


Fig. 4—Schematic diagram of a typical Hydromatic propeller installation.

# Automatic Transmission Has Pneumatic Control

**A**N automatic transmission with pneumatic control has been developed and patented by A. B. Clark of Boston, Mass., and is illustrated by the two accompanying drawings, of which Fig. 1 is a vertical section through the transmission, while Fig. 2 is a diagrammatic view, partly in section, of the control mechanism.

Referring to the sectional view, it will be seen that the transmission has a drive shaft, an intermediate shaft, and a tail shaft, all concentric with each other. That part of the tail shaft which is inside the transmission housing is splined and carries a gear which can be shifted—by means of a lever on the steering post—into engagement with the reverse pinion or into a position where it locks the tail shaft to the intermediate shaft, for forward drive. Aside from this gear on the tail shaft, the arrangement of the gearing is substantially the same as in the conventional

three-speed transmission, there being a pair of first-reduction gears at the forward end of the housing, and pairs of gears for intermediate and low speed in the central portion thereof. The low-speed driven gear is slidably mounted on a sleeve. When it is shifted toward the rear it comes into mesh with the low-speed pinion on the countershaft, whereas when it is shifted forward, it clutches the intermediate driven gear to the driving sleeve, on which this gear revolves idly otherwise.

It will be seen from the sectional

drawing that there are three sliding members in the transmission, viz., the one at the rear, by which the transmission can be set by hand for either forward or reverse drive; the one at the center, which engages low gear when shifted toward the rear and intermediate when shifted forward; and the one at the front, which engages the direct drive when moved forward, gives forward drive in low or intermediate gear through the overrunning clutch (free-wheeling unit) when in an intermediate position, and a positive drive in low or intermediate gear when in its extreme position toward the rear.

From Fig. 2 it can be seen that there are two vacuum cylinders, whose pistons are connected through suitable linkage with the two power-actuated sliding members of the transmission. Each cylinder has its own vacuum control valve, and these valves are under the influence of two centrifugal governors, driven from the propeller shaft, so that they rotate in proportion to car speed. Normally the governor

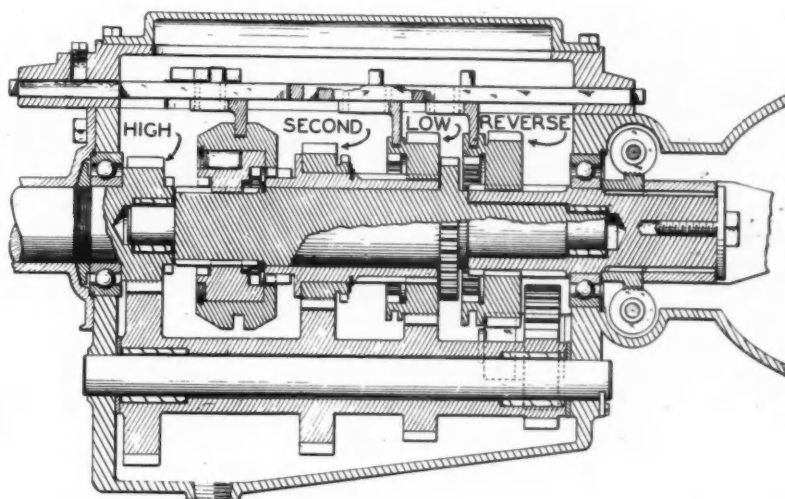


Fig. 1—Vertical section through Clark automatic transmission.

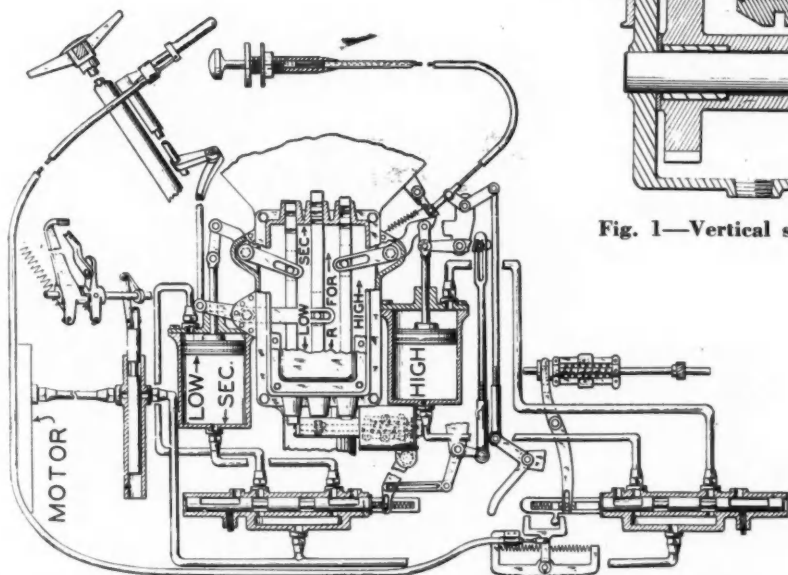


Fig. 2—General arrangement of control mechanism, partly diagrammatic

spring holds the valve in one extreme position, and when the appropriate speed for shifting is reached, the centrifugal force on the fly-balls shifts the valve to admit vacuum to the control cylinder and effects the shift. When the over-running clutch unit is shifted to the rear all the way, it is locked, so that the engine can be used as a

(Turn to page 122, please)

# Czechoslovakia

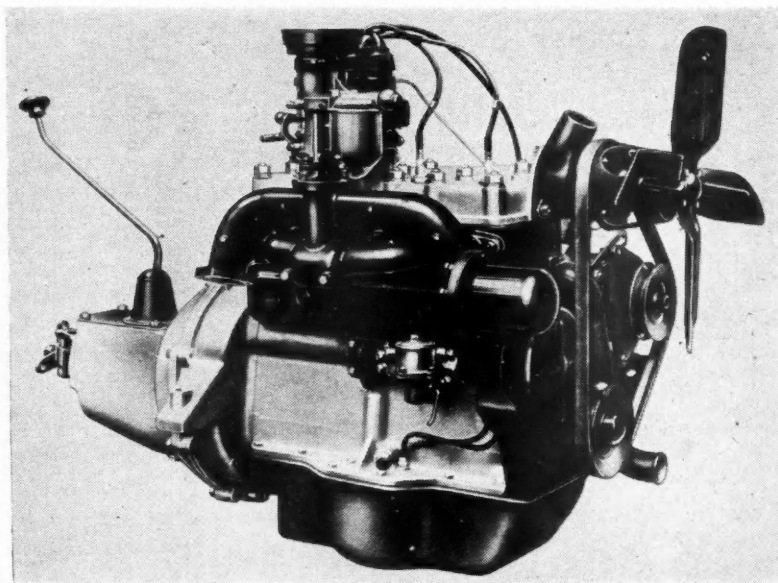


Praga Piccolo four-passenger small car

**T**HE Czechoslovak Praga Automobile Works of Prague have brought out a new small four-cylinder car of 69 cu. in. displacement, known as the Praga Piccolo. It is of the general type of small car that is so popular in Central Europe. The four-cylinder engine has a bore of 2.56 and a stroke of 3.34 in., and with a compression ratio of 6.5 the engine develops 28 hp. at 3500 r.p.m. The weight of the car is 1860 lb. and when operating on the 20 per cent alcohol mixture compulsory in Czechoslovakia, the fuel mileage is said to be 26 to the U. S. gallon.

The cylinders are cast integral with the crankcase, but in order to keep down the weight of the block, steel pressings are used for the oil sump, front-end-drive gear cover, valve-chamber cover, etc. The cylinder head is an aluminum casting. Lubrication is by pressure-feed, a gear-type pump being used, and a gage on the dashboard indicates the oil pressure. All of the oil circulated by the pump is compelled to pass through a strainer, and a part of the circulating oil is passed also through a felt-type filter.

The crankshaft is supported in three main bearings and the camshaft is driven from it through helical silent gearing. From the cam-



Powerplant of Praga Piccolo

shaft are driven the ignition unit, the oil pump, and the A.C. fuel pump. Pistons are of the Bohnalite type, with three compression rings and one oil ring. Connecting rods have babbit linings. The carburetor is of Zenith downdraft type, and is equipped with a device facilitating starting. Crankcase ventilation is provided for, and the ventilating air has to pass through the oil-wetted

type of air cleaner. There is a ball valve in the suction pipe which is intended to dispose of any overflow fuel. The centrifugal water pump is mounted on the cylinder head and is driven by a V belt which also drives the generator. A thermostat assures quick warming of the engine when starting from cold.

The single-plate clutch is provided with an elastic disc which ensures

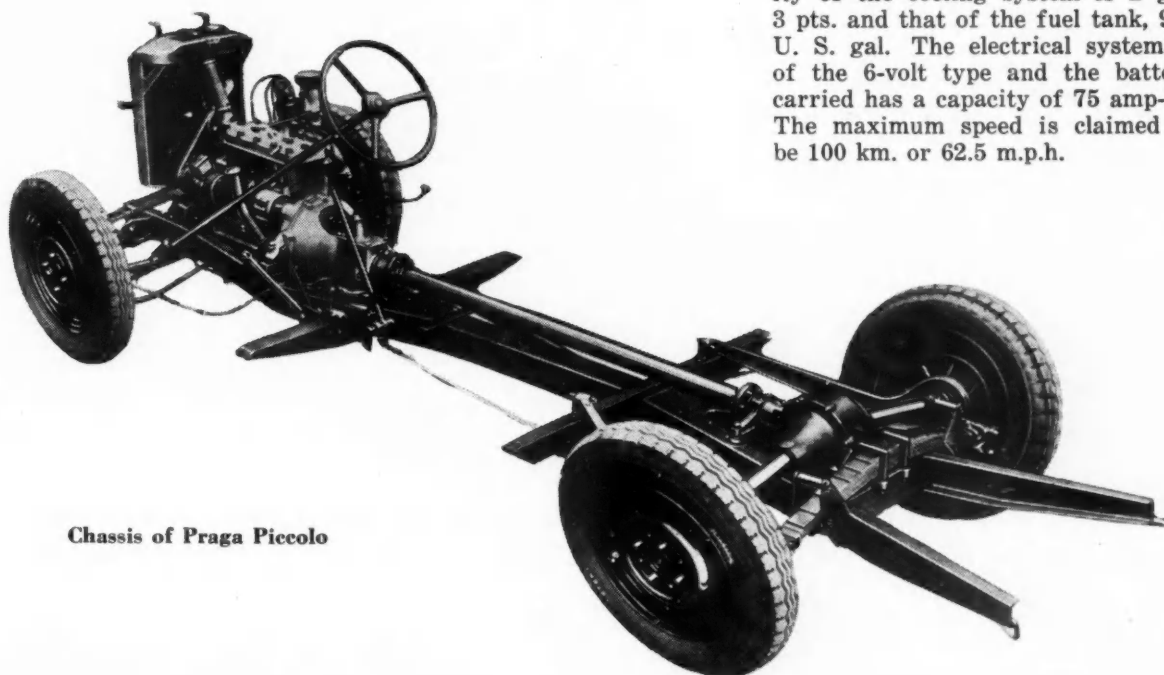
# Has a New Light Four

soft engagement and at the same time damps out crankshaft vibrations. Four forward speeds and a reverse are provided by the transmission, which is combined with the engine. Third and fourth speeds are synchronized. The final drive housing is supported from the frame through rubber mountings. Oscillating semi-axes are fitted into the case and supported by the spherical covers. Inside the final-drive housing are located the universal joints required for the swinging axles, these joints being located at the center of the differential side gears. The differential, universal joints, and spherical surfaces are oil-lubricated from the final drive housing. Driving thrust is transmitted from the half axles to the frame through radius rods which have an elastic connection to the frame. At the rear these radius rods are connected to the fittings of the semi-elliptic transverse spring.

The front axle consists of two semi-elliptic cross springs, one above the other. Friction dampers are provided to damp wheel oscillations. A rack and pinion-type steering gear is used. Mechanical brakes act on all four wheels and have means for adjustment that are easily operated. All four brakes can be applied optionally by either pedal or lever. The frame is built up of steel pressings, with a central reinforcing beam that is forked at both front and rear. At the front it is provided with brackets for mounting the powerplant on rubber.

The body is of a design conforming to the latest European practice, and affords accommodations for four persons. It has two doors. The front seats have hinged supports and can be adjusted according to individual requirements. There are ventilators in the body front at the sides of the hood. The trunk is accessible from both outside and inside and is locked by the same key as the doors. The spare wheel is carried under the trunk.

The car has a wheelbase of 103 $\frac{3}{8}$  in.; the tread is 46 $\frac{1}{2}$  in. at the front and 48 $\frac{3}{4}$  in. at the rear. The capacity of the cooling system is 2 gal. 3 pts. and that of the fuel tank, 9 $\frac{1}{4}$  U. S. gal. The electrical system is of the 6-volt type and the battery carried has a capacity of 75 amp-hr. The maximum speed is claimed to be 100 km. or 62.5 m.p.h.



Chassis of Praga Piccolo

# Ganz Automatic Torque Control

WITH Diesel engines of the moderate-speed type, the fact that the torque curve is comparatively flat presents certain disadvantages. For one thing, with a nearly constant torque, the horsepower will increase almost in direct proportion to the speed, somewhat as indicated by the line C-B in Fig. 1. If Diesel engines are operated for long periods at approximately their peak horsepower, they are subjected not only to great mechanical stress but also to high heat stress, and their life is apt to be short. To prevent such operation, means are usually provided which make it impossible for the driver to get more than a moderate amount of torque from the engine, considering its displacement. These means are usually in the form of a stop on the quantity-control rack of the injection pump. The horsepower and torque curves then may correspond to lines A in Fig. 1. This system of control, however, also limits the torque obtainable at low engine speeds, which is rather objectionable where mechanical or stepped transmissions are used. During periods of acceleration, for instance, if the engine developed more torque at low speeds, more of the accelerating could be done at relatively low engine speeds, and wear and tear due to both mechanical and thermal stresses kept down.

Ganz & Company of Budapest, Hungary, have developed a system of governing for their railway Diesel engines which will not permit of overloading the engines at high speeds, yet will give high torque at low speeds. The system gives the torque and horsepower curves marked C in Fig. 1. Limitation of the torque at high speeds is obtained by means of a speed-sensitive governor, which is shown in section in Fig. 2. This governor is provided with a number of springs which come into action successively. It gives a number of different speed ranges, notably low idling speed and an intermediate speed corresponding to about 70 per cent of the full speed, this intermediate speed being used when making gear changes; at the same time it limits the maximum speed which can be attained.

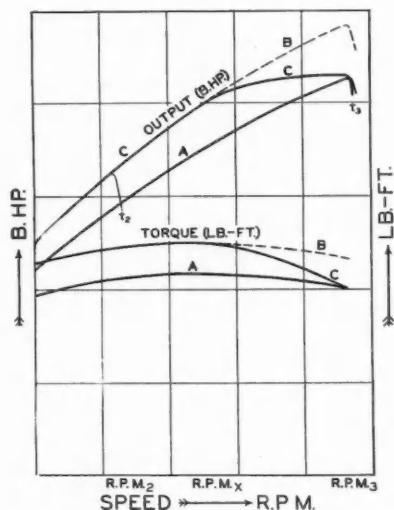


Fig. 1 — Horsepower and torque curves of conventional Diesel engines and those fitted with the Ganz system of torque control

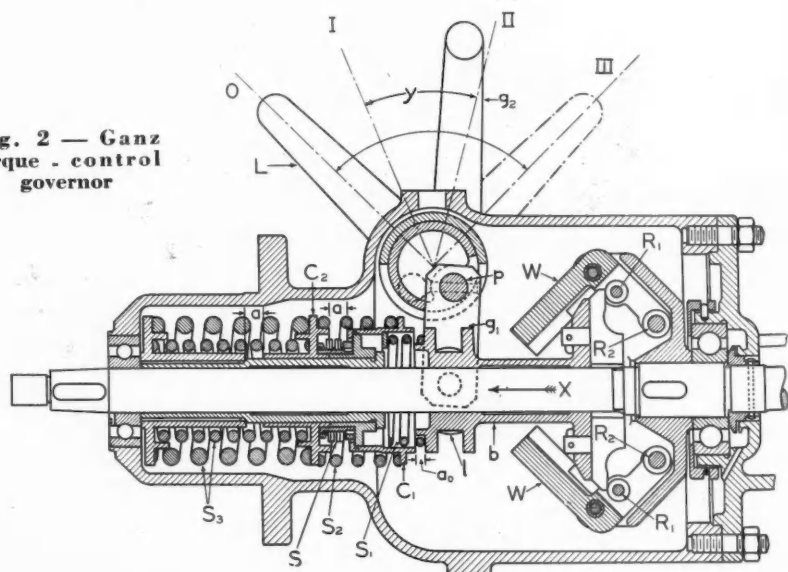
The method of operation of the governor is as follows: Governor weights  $W$ ,  $W$  press against sleeve  $b$  by means of rollers  $R_1$  or  $R_2$ . With an increase in the speed of the engine, the weights will fly out from the axis of rotation and displace sleeve  $b$  in the direction of arrow  $X$ , against the pressure of springs  $S$ . This motion is transmitted by slide  $l$ , mounted on the fork  $g_1$ , through pin  $p$  to lever  $g_2$ , which

latter connects to the quantity control rack of the fuel injection pump, and controls the quantity of fuel injected per cycle in accordance with the speed of the engine.

Pin  $p$  of levers  $g$  is journaled eccentrically in lever  $L$ , and owing to the angular motion of lever  $L$  in the direction of arrow  $y$ , pin  $p$  will change its position in such a manner that with lever  $L$  in the zero position, lever  $g_2$  will keep the quantity control rack in the "no delivery" position, that is, the engine will be stopped. If lever  $L$  is now moved to position I, the idling spring  $S_1$  is brought into effect. If the engine is now started, weights  $W$ ,  $W$  will move sleeve  $b$  against the pressure of the spring  $S_1$  until  $b$  contacts  $c_1$ . During this motion of sleeve  $b$ , lever  $g_2$  has moved the quantity control to the idling position, and the engine will then idle at a speed determined by the pressure of spring  $S_1$ .

When lever  $L$  is moved to position II, spring  $S_2$  is brought into action. The speed of the engine now increases until roller  $R_2$  engages the pressure plate on sleeve  $b$  and moves the latter through the distance  $a_0$ , when the sleeve makes contact with the flanged sleeve  $C_1$ . As soon as the speed of the engine reaches the value r.p.m.<sub>2</sub> (Fig. 1), flanged sleeve  $C_1$  also will be moved axially and

Fig. 2 — Ganz torque control governor



lever  $g$  of the governor will begin to again reduce the fuel supply. The effect will be as indicated by curve  $t_2$  in Fig. 1. Practically the same sequence of events is repeated when lever  $L$  is moved to position III. The engine speed then increases to r.p.m., flanged sleeve  $C_2$  is moved axially to the left, and lever  $g_2$  acts on the quantity control rack to again reduce the fuel supply, with the effect indicated by  $t_3$  in Fig. 1. This curve represents the highest permissible engine speed. The plate spring  $S_0$  opposes spring  $S_2$  and enables lever  $g_2$  to reduce the fuel injection so as to give the torque and horsepower curves  $C$  (Fig. 1), starting at a speed r.p.m.. The injection quantity is cut down in such proportion that the engine output remains substantially constant up to speed r.p.m.. Were it not for the plate spring  $S_0$ , the output would follow curve  $C$  up to r.p.m., and beyond that, curve  $B$ .

Fig. 3 is a tractive effort chart obtained with this form of engine governor. The tractive effort  $Z$  is equal to 1.0 with the engine driving the car through fourth gear at full speed. Curves I, II, III, and IV represent the tractive efforts obtainable

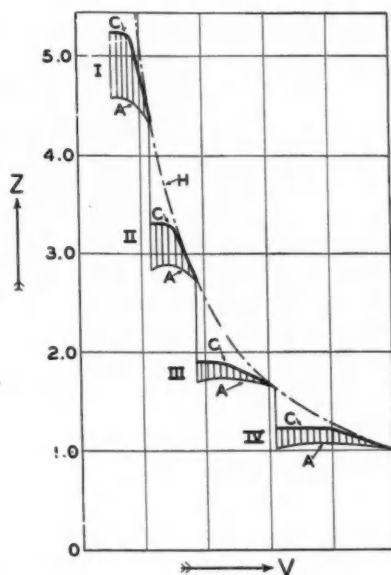


Fig. 3—Tractive effort diagram

through the various gear speeds. Curve  $C$  represents the tractive efforts that correspond to engine torques and horsepower represented by lines  $C$  in Fig. 1, and curve  $A$  the tractive efforts corresponding to torques and horsepower repre-

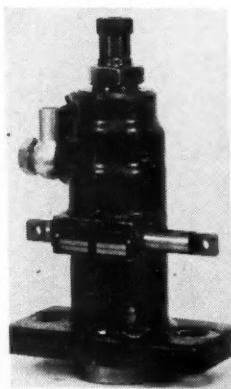
sented by lines  $A$  in Fig. 1. These tractive efforts are plotted against the car speed  $V$ . Curve  $H$  represents the maximum tractive efforts that could be obtained if the car were fitted with a continuously variable transmission.

Messrs. Ganz point out that the mechanical change speed gear is the lightest, least expensive, most reliable, and most efficient of all transmissions known, and its only drawback is that, as mentioned in the introduction, it permits of full utilization of engine power only at certain definite speeds. While there are steps also in the tractive-effort curve as shown in Fig. 3, they are smaller than where a conventionally governed engine drives through a mechanical transmission, and considering that in electric and hydraulic transmissions the loss in transmission amounts to about 20 per cent, Messrs. Ganz & Company claim that over the greater part of the speed range the engine output is used to better advantage than it would be with either the electric or the hydraulic transmission, and there are hardly any points of the speed range where it is utilized less effectively.

## Bendix Enters the Injection-Equipment Field

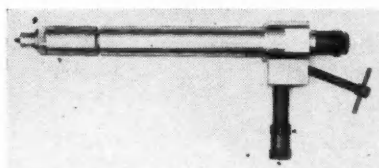
SCINTILLA MAGNETO CO., INC., Sidney, N. Y., a Bendix subsidiary, has entered the field of fuel-injection equipment for Diesel engines. The injection pumps are of the port-controlled type and are built in single-cylinder, flange-mounted units with standard mounting dimensions. They can be supplied in eight sizes, with plunger diameters ranging between 10 and 17 mm., all having a stroke of 15 mm. These pumps, which are the result of several years of research and development work, are said to represent a distinct advance over previous injection equipment.

The pump cylinder, driving tappet and control mechanism are housed in an alloy-iron casing. The upper end of the cylinder has two ports, arranged longitudinally, of which the upper one serves as the intake and the lower one as a by-pass. Each port opens a separate annular groove, machined in a stainless-steel insert which surrounds the upper end of the cylinder, both grooves joining at the intake fitting. This design makes it possible to obtain a uniform-suction period and tends to prevent erosion of the pump casing from sharp surges during the by-



Bendix fuel injection pump

Bendix spray nozzle and nozzle holder



pass period of its operation.

On one side of the plunger there is a simple helical metering groove with a ground upper edge. On the opposite side is a small helical lu-

bricating groove. These grooves are connected to the upper end of the plunger by central and cross holes. It is claimed that the plunger and barrel construction results in an unusually effective seal at the ports, and accurate metering over long periods of operation.

The quantity of fuel is controlled by a gear sleeve and rack of liberal proportions. The delivery valve is of the needle type, so proportioned that ample line pressure relief and sharp pressure drop are obtained. The tappet mechanism is light and made of carefully selected alloy steel. The enclosed parts are lubricated at three points.

Bendix nozzle holders for use with the pumps just described are offered in six different lengths of shank. Spray nozzles are supplied in two different types, permitting 12 different combinations of nozzles and holders. Nozzles are of the differential type and are available either with spray orifices drilled directly into the nozzle body or with separate spray tips. The needle lift is limited by a steel plate, hardened and lapped. An edge-type filter is inserted in and forms part of the inlet fitting.

## Automatic Transmission Has Pneumatic Control

(Concluded from page 117)

brake in low and intermediate gear. The valve which controls admission to the vacuum cylinder by means which the overrunning-clutch drive unit is shifted, is so arranged that once it is in its high-speed selecting position it remains there until moved by the operator by pushing the sliding grip on the control lever all the way in.

There is an interconnection be-

tween the piston which shifts the overrunning-clutch drive unit and the governor arm which controls the other vacuum-shifting unit, with the result that when the high speed is engaged, the vacuum valve which controls the other shift cylinder is automatically forced into the intermediate-speed selecting position and held there until the high speed is disengaged again, which is said to eliminate much shifting and wear of these parts.

A Bowden-wire mechanism actuated by means of a knob enables the driver to lock the free-wheeling

unit and thus to obtain positive gear drive. A free-wheeling effect is normally had while in low and intermediate gear, which facilitates gear-shifting. There is no free-wheeling effect when the car is in direct drive, and the dangers of free-wheeling at high speed are therefore avoided.

The correspondent who sent in the description of this new transmission lays particular emphasis on its simplicity of construction, operation, and servicing. It seems to this writer, however, that whether this device is really simpler than the conventional three-speed gearbox is very much open to question, as it has three distinct manual controls (the rocking lever for forward, neutral, and reverse, the control knob for locking the free-wheeling unit, and the sliding grip on the control lever for manually shifting one of the two vacuum valves), instead of the single shift lever on the conventional transmission. However, it may be that what was intended was not a comparison with the conventional transmission but with some of the other automatic and semi-automatic transmissions of which details have been disclosed in the patent records.

**B**RASIL produces approximately 16 million gallons of alcohol per year, in about 150 distilleries. The raw material for the greater part of this alcohol is sugar cane. The law at present prescribes the addition of 17.56 per cent of absolute alcohol to motor gasoline, but the distilleries have not been able to furnish more than about one-quarter the amount of alcohol required. The Government, therefore, is promoting the establishment of new distilleries, and lends financial aid to new enterprises in this line of industry, hoping thereby not only to aid the agricultural population, but also to conserve its foreign exchange by restricting the imports of petroleum products.

**A**S a further step in the program to render Italy self-sufficient in the matter of raw materials used in the production and operation of automobiles, a firm has been organized under the title Saiga (Societa Anonima Industriale Gomma) which will undertake the cultivation of the guayule shrub in Italy, and finance industrial enterprises for the utilization of the sap of this plant. The guayule is a shrub which is native in Mexico and southern Texas, and furnishes a form of rubber.

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